Construction and Maintenance

Engineering and Highway Departments

Street Opening or Utility Cuts

WIDE variations in practice are shown in the methods of issuing permits, opening pavements and restoring them. This annoying problem was reported upon by a committee of the American Road Builders' Association, of which R. A. MacGregor, Maintenance Engineer for the borough of Manhattan, New York, is chairman. Among the committee recommendations were the following standard practices:

All public utilities should be installed before paving.

It is questionable whether either water or sewer connections should be carried to the curb; many spurs may never be used and the caps may leak.

Permits to open streets should be issued for each block at a time. Blanket permits for long periods or for long stretches should not be issued.

Responsibility for future trench settlement should be placed definitely at the time of issuance of the original permit.

Emergency permits should be immediately followed by a regular permit.

A temporary pavement should be required immediately after all cuts in paved streets.

Healthy growth of any city prohibits a restriction against opening streets for connections.

More attention should be paid to reinforcing, battering or dowelling new cuts to the old pavements as well as cutting back to gain support beyond the edges generally practiced.

In closing cuts in concrete pavements, wider use should be made of accelerators or quick-hardening cements, thus expediting the resumption of traffic.

Regulations for Utility Cuts in Bethlehem, Pa.

A CITY ordinance requires a permit for making cuts in city streets. A charge of $1 is made for the issuance of the permit. To this is added a deposit amounting to $5 per square yard where the cut is made in first-class paving having a concrete base and the minimum trench charged for is 36 inches. The ordinance permits charging for an area 6 inches beyond the area actually cut, and a $5 additional charge where trolley tracks are crossed. For penetration bituminous macadam, with or without a crushed stone base, the deposit is $3 per square yard, and for bituminous surface treated pavement, the charge is $1 per square yard. City forces replace the surface, and if the deposit exceeds the actual cost of replacement, there is a refund to the applicant; on the other hand, if the cost exceeds the deposit, the applicant is required to pay the difference.

ROBERT L. FOX,
City Engineer.

Fees for Pavement Cuts in Easton, Pa.

A DEFINITE schedule of fees which must be paid to the City Treasurer before a permit is issued by the City Engineer for cuts in city pavements was established and approved by the City Council of Easton as of June 16, 1928. This ordinance requires the following deposits per square foot of estimated surface cut:

	Per Sq. Ft.
Amiesite, on macadam base	$.40
Amiesite, on concrete base	.50
Brick, concrete base	.55
Bituminous macadam	.40
Kyrock	.35
Belgian block	.50
Stone surfaced	.15
Unimproved	.05
Reinforced concrete	.55

C. A. REESE,
City Engineer.

Clairton, Pa., Requires a $50 Deposit for Pavement Cuts

A CITY ordinance of Clairton, Pa., requires that any utility or individual making a cut in a city street must first secure a permit from the City Engineer. The applicant cuts the pavement and digs the trench, but all backfilling and surfacing replacements are done by city forces. A deposit in cash according to the following schedule, or a $2,000 bond, must be deposited with the City Clerk, based on the City Engineer's computation. The minimum deposit for a cut in an unpaved street is $10; for an unpaved street which is surfaced with slag or ashes, $25, and for all kinds of paving, $50. For backfilling, the deposit is $5 per cubic yard on unpaved streets and $6 per cubic yard on paved streets. For replacing surfacing, such as brick, concrete, asphalt or other hard surface, a deposit of $6 per square yard is required.

P. M. STEELE,
City Engineer.

Payment for Pavement Cuts in Butler, Pa.

A CITY ordinance requires application for a permit when cuts are to be made in city pavements, and the signing of an agreement by the applicant that he will pay the actual cost of refilling and repaving which is done by the city. The applicant makes a deposit with the City Clerk amounting to a minimum of $5, or $2 per foot of 18-inch maximum width trench. Upon the making of the deposit, the City Clerk issues the permit. If the cost is less than the deposit, the balance is returned to the applicant; and if more, the applicant is required to pay the difference.

FRED M. HARPER,
City Engineer.

A Municipality's Vertical Transportation Problem

A TRANSPORTATION problem involving moving the greater part of a city's population between an upper and a lower level has recently been solved in Bahia, a city in northern Brazil. With its business center bordering on the bay and its residential district at the top of a steep incline 195 feet above, the question of transportation was always a perplexing one. Within recent years, as a result of the rapid growth and general progressiveness of the city, the need for modern transportation facilities became extremely acute.

At the suggestion of consulting engineers, the monumental La Cerda Tower was built. It is made of reinforced concrete, 240 feet high, and connected with an older and smaller structure by a bridge. In it are housed two large Otis express elevators, comparable with those in the largest skyscrapers. On the opening of the tower recently, a holiday was called in Bahia. A military band was in attendance and fireworks were displayed. The Governor of the state and the Mayor of the city officiated.

Practically the entire city tried to ride on the new elevators that night. On the second day, the elevators transported more than 24,000 people, each passenger paying 160 reis, or a little less than two cents a trip. To supplement the transportation supplied by the elevators, an inclined railway is now being developed by the Otis Company. This is to have two cars, each with a capacity of forty,

THE NEW LA CERDA TOWER, PROVIDING VERTICAL TRANSPORTATION BETWEEN THE BUSINESS AND RESIDENTIAL DISTRICTS OF BAHIA, BRAZIL

Sandusky's Million-Gallon Tank *Stabilized Pressure and Cut Pumping Rate Materially*

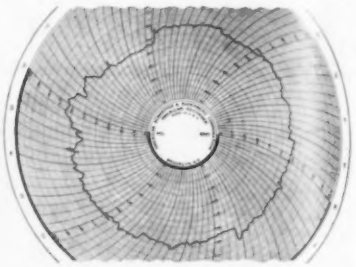
EXPERIENCE covering a year and a half has now verified the earlier reports of the important improvements achieved in the water supply of Sandusky, Ohio, through the installation of a 1-million gallon Horton radial-cone bottom tank.

These improvements effect both the consumer and the city's water department. The consumer profits through better pressure. Instead of a fluctuation in the pressure of 35, 40, or even 50 per cent during the day, records now indicate variations of less than 10 per cent. This is largely attributable to the storage of an adequate volume of water at an elevation which stabilizes pressure in the mains. The result is further improved by the particular design of the tank. With a diameter of 85 feet it is only 22 feet 6 inches deep so that the maximum difference in pressure made between a tank full and empty is only 10 pounds. The normal variation in the service is about one half that much.

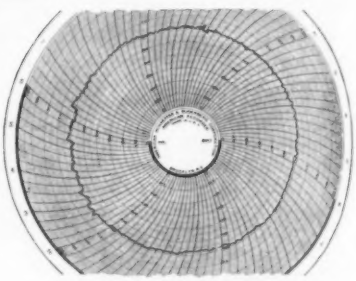
The water department profits through improved operating conditions. The maximum pumping rate used to run up to considerably more than 7 million g.p.d. with a minimum of 2,700,000. Now the maximum rate, under identical mid-summer conditions, is only 4 million g.p.d. with a minimum of about 2 million. Ability to pump a large part of the daily flow in periods of lower power costs and to use pumping equipment at rates of maximum efficiency are factors which materially reduce total operating costs. The shallow depth of this tank improves pump efficiencies because the head against which the pumps are working remains constant within narrow limits.

We will gladly cooperate with your engineers in estimating the cost of any tank or standpipe you may be considering.

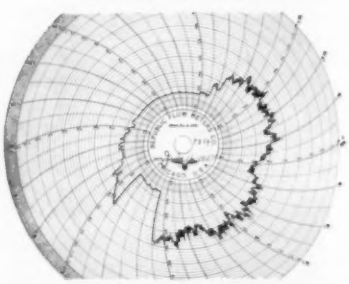
PRESSURE



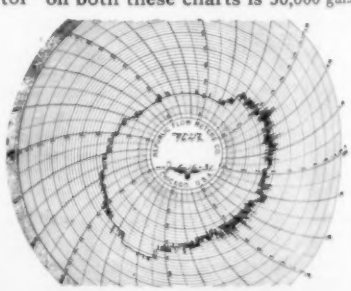
Pressure readings at the pumping station for a full summer day before the tank was in service are shown above and similar readings one year later—with the tank in use—are shown below. The effect on the standard of service, particularly of fire protection, is obvious from a comparison of these charts.



FLOW



The rate of pumping without a tank is shown above. Note the continuous and extreme variations. One year later the rate with the tank in use was as shown below. Note how uniform it is from 8 a. m. to 6 p. m. The heavy drain for sprinkling raises it somewhat during the evening hours. The "factor" on both these charts is 50,000 gals.



CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.
New York	3108 Hudson Ter. Bldg.
Cleveland	2236 Midland Bank Bldg.
Detroit	1501 Lafayette Bldg.
Phila.	2616 "1616" Walnut St. Bldg.
Boston	1501 Consolidated Gas Bldg.
Birmingham	1502 Fiftieth St., N.
Dallas	1206 Burt Bldg.
San Francisco	1033 Rialto Bldg.
Seattle	4343 Smith Tower
Houston	1101 Electric Bldg.
Tulsa	1425 Philcade Bldg.
Los Angeles	1303 Pacific Mu. Bldg.
Havana, Cuba	Apartado 2507

HORTON TANKS

AC2-Gray

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Rational Federal Aid for Municipal and Private Water Works

A COMMITTEE on Immediate Water Works Betterments for Unemployment Relief, with an imposing personnel of members of the American Water Works Association, has been at work for some time on a program to secure immediate improvement of the standards of water service as an aid to unemployment and without anticipating future betterments. Therefore, the proposal does not borrow from the future but is a rational proposition for the immediate raising of the standard of water supply in a large number of communities in the United States. Many water works in all parts of the country are sadly deficient in supply and quality, as demonstrated by the recent drought; also in general distribution systems, and particularly in street mains of sufficient size suitably interconnected to provide adequate fire protection. Much of this work has been needed for a long time. Nationally organized private financing or Federal aid offers an opportunity for doing much needed work which will be of permanent value in this field.

The Committee offers a conservative estimate of the money which could be expended in the immediate future to meet the most urgent needs as follows:

For reinforcement of distribution systems, including gates, hydrants and elevated storage	$200,000,000
For replacement of small pipes in distribution systems with pipes of adequate size	100,000,000
For extensions of distribution systems to give fire protection in outskirts of communities	50,000,000
For new or additional supplies or purification works, the need for which was demonstrated by the recent drought, and as probably represented in part by deficiencies in normal 1931 and 1932 budgets for water-works improvements	200,000,000
	$550,000,000

This system does not include such large water-supply projects as are being developed or are under consideration for New York, Los Angeles and Philadelphia.

Under ordinary conditions this estimate would be divided into $330,000,000 for local labor and $220,000,000 for materials delivered in the communities. Of the amount for materials delivered, $20,000,000 would be for freight from foundries to the point of use. The production and manufacture of the materials would furnish employment for much labor, would pay freight on raw materials, and aid industry in general. The industries employed would be iron mines, producers of pig iron and steel plate, manufacturers of cast iron, steel and concrete pipe, gate valves, hydrants, meters, cement, jointing compounds, tools, paving materials, painting materials, lumber for sheeting, etc., and the railroads, trucking interests and indirectly all retail stores.

Adequate local municipal and corporate organizations are now in existence for performing this work with the assistance of local labor of various kinds readily obtainable. A large proportion of such labor would be unskilled and would not need to have had previous experience.

There need be very little delay in beginning the work after it is authorized. Plans for a large proportion of this work are already in existence. They will not be carried out at present unless financing is made attractive and the work receives general approval as a relief measure. Little if any land would have to be acquired, for the work is largely in public streets and on lands already owned by municipalities or corporate organizations. On much of the work little machinery could be used advantageously.

To the extent that Federal aid is advanced for water-works betterments, present municipal credit is made available for other badly needed work. All of the work entailed will produce real values which will pay their way and be paid for by the people benefited. If the Federal Government sees fit to give funds for this purpose, it will give useful work for labor needing it, but in case this is not done, loans will make some of the work possible if the terms of the loans are sufficiently attractive.

The work done will produce property of very long life and usefulness which will justify long-term bonds. The property will be part of that required for water service and fire protection, needed utility services for which charges can be made locally and which are usually, if not universally, commensurate with the value of the service rendered. The annual average cost of these needed improvements per capita for the population living in cities, which amounts to 69,000,000 people in communities of more than 2,500 population, would amount to 36 per cent for the first five years and 46 cents for the next 35 years, when all payments would cease. This is based upon 40-year bonds at 4½ per cent interest with amortization beginning in the sixth year on the basis of equal annual payments for interest and amortization amounting to about 5.73 per cent.

This plan would be beneficial to individual communities and to the country as a whole. It is certain that its universal execution will result in improvement of public health and in some reduction in the annual fire loss, which reached the amount of $499,739,172 and cost 10,217 lives in 1930. If such reduction amounted to as little as 6½ per cent, or $33,000,000, a year, capital charges would be returned in less than 40 years upon the total cost of the plan. Such conservation would continue for possibly another 40-year period after the works were paid for.

The initiation of a national program directed to betterments in water quality and in fire protection afforded by water-works systems would make possible closer cooperation between public health authorities, public service commissions, fire insurance organizations and communities, which should lead to improvements in standards of quality, fire prevention and fire protection other than afforded by the water-works system.

The plan proposed by this Committee of the American Water Works Association will increase the total investment in water works about 14 per cent, for which capacities of distribution systems may be increased by a great percentage. It does not, however, anticipate usual normal betterments but is directed toward a universal raising of standards of water service and fire protection. Continuation of normal expenditures for betterments will tend to maintain such higher standards. If needed water-supply works which might normally be part of construction programs in the immediate future were to be included, the estimate would be increased accordingly.

Financing of these water-works betterments should be made equally available to municipal and to private organizations owning and operating public water-works systems.

When this plan was placed before the Board of Direction of the American Society of Civil Engineers, during the annual meeting of the Society in New York, January 21, 1932, it adopted the following resolution approving the plan in principle:

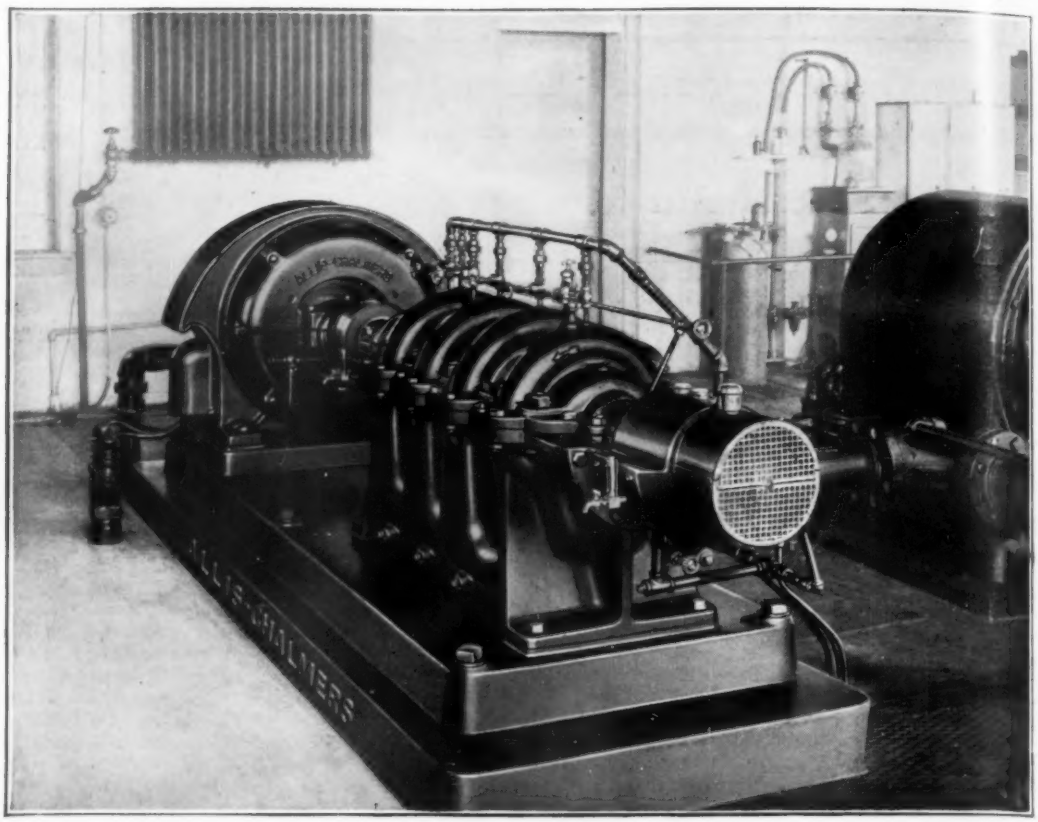
Whereas, the Congress of the United States is giving consideration to the necessity and advisability of extending Federal aid to provide work relief for unemployment, and

Whereas, a Committee of the American Water Works Association with the approval of its Board of Directors has prepared a Plan entitled "Immediate Water Works Betterments for Unemployment Relief," and

Whereas, this Plan demonstrates the economic values to be derived by the performance of such betterments through the aid and assistance of direct grant or loans of credit to municipalities and corporations owning works for supplying water for domestic, industrial and fire protection purposes, and

Whereas, the Plan further suggests that if the direct grant or loan of credit method does not appear to be desirable, provision be made whereby suitable financial assistance to that same end may be readily provided through the auspices of the Investment Bankers Association or other organization of financial interests.

Be it resolved, that the Board of Direction of the American Society of Civil Engineers approves said Plan in principle.



PUMPS worth knowing

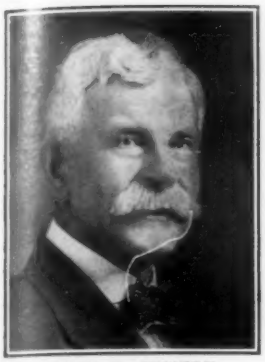
5"x4" Four Stage Type "M" Allis-Chalmers Centrifugal Pump with 200 h.p. Allis-Chalmers 1760 Rev. slip ring motor furnished in 1929 for City of Ironwood, Michigan. Rating 900 g.p.m., 630 ft. head. (Note absence of any vibration—picture taken with unit running.)

The Allis-Chalmers latest type of multi-stage pumps (Type "M") are proving so remarkably satisfactory and efficient in service that cities can not afford to overlook their advantages even though their first cost may be slightly more than that of other pumps. The unit illustrated has saved the city where it is installed more than twice its original cost in the first year of pumping.

Bulletin 1642 describing the type "M" pump will be sent on request to city officials who wish to investigate the savings possible by installing this improved pump.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee



JAMES D. SEIBERT
Supt., Water Dept.
Bellefonte, Pa.
(Appointed 1920)

CHARLES C. CASAD
Commissioner, Public Works
Bremerton, Wash.
(Appointed 1923)

GEORGE J. TURGEON
Supt., Water Works Dept.
Rocky River, Ohio
(Appointed 1915)

CLARENCE E. PLOCH
Supt., Water Works
Mt. Vernon, Ind.
(Appointed 1924)

JAMES SHEAHAN
Gen. Supt., Water Dept.
Memphis, Tenn.
(Appointed 1923)

Who's Who in Water Supply

The 49th of a Series of Portraits of Water-Works Officials Which Has Appeared Monthly Since January, 1928

JOHN J. DEROLF
Water Commissioner
North Platte, Nebr.
(Appointed 1923)

CHARLES G. WEISHAAR
Supt., Water Works and Sewerage, Amite, La.
(Appointed 1922)

BERNARD L. ULRICH
Supt., Water Works
Manhattan, Kans.
(Appointed 1915)

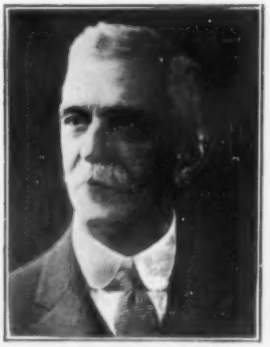
PETER LEMETER
Supt., Water Department
Grand Forks, N. Dak.
(Appointed 1914)

C. E. PERKINS
Supt., Bartlesville Water Co.,
Bartlesville, Okla.
(Appointed 1928)

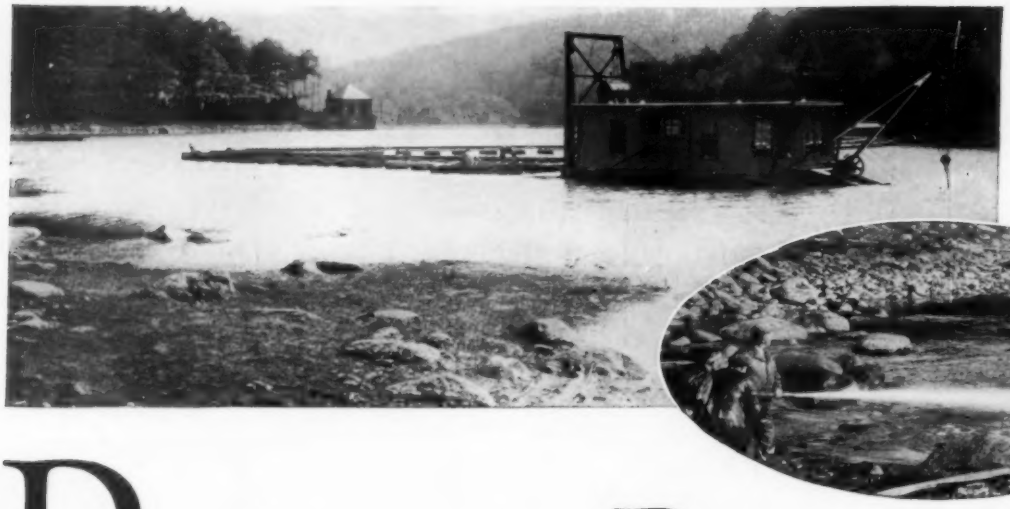
ROSWELL M. ROPER
Engr. & Gen. Mgr., Water Dept.
East Orange, N. J.
(Appointed 1918)

GEORGE R. REINHARDT
Water Commissioner
Enid, Okla.
(Appointed 1927)

J. H. FEWELL
Supt., Water Works
Jackson, Miss.
(Appointed 1908)



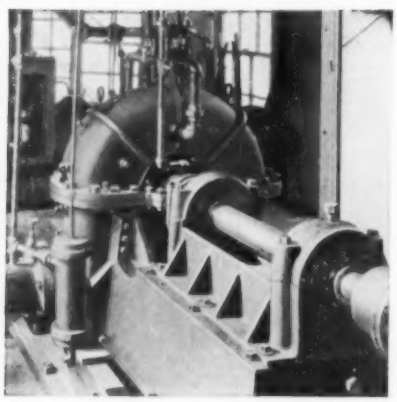
GEORGE REYER
Supt., Water Works
Nashville, Tenn.
(Appointed 1882)



Macopin Intake Reservoir occupies about 12 acres and has a capacity of some 32 million gallons. Three jets are being used to scour off the bottom and a 6-in. Morris Horizontally Split Double Suction Pump direct-connected to gasoline engine furnishes water for these jets at a pressure of 92 lb. per sq. in.

Dredging the Dregs

from municipal drinking water



This compact Morris Gasoline-engine-driven Cutter Dredge is only 31 ft. long with 14-ft. beam and 2-ft. draft. The steel hull is made in two sections for portability. All wearing parts of the Morris Dredge Pump are of manganese steel and the suction cutter equipment and hoist are also of Morris design. This type of dredge has a wide application on municipal improvements, sand and gravel production, etc., where the deposits to be removed are limited in quantity and of highly abrasive character.

THE Macopin Intake Reservoir serves the purpose of catching the silt and sediment in Newark's Water System so that impurities cannot enter the pipes supplying the city. The accumulations must be removed periodically and this work is now being done in a very interesting manner. The problem consists of removing some 26,000 cu. yd. varying in thickness from a mere film to a depth of 4 ft. over boulders, roots and smaller stones of all sizes and shapes.

The engineers of the Bureau of Water decided upon a combination of a six-inch cutter dredge and jetting equipment. The dredge was started as close to the upper end as permitted by the depth of the reservoir and delivers the material through 1800 ft. of 8-in. discharge pipe. Jets are being used to scour off the uncovered portion of the bottom, forcing the sediment into deeper water where it can be reached by the dredge. As the work progresses, the dredge is backed up and the water level is lowered, successively uncovering more of the bottom which is then further cleaned by the jets.

The contractor who furnished and installed the equipment was also required to place it in successful operation and chose Morris Equipment for both the dredge and the pump supplying the jets. All of the Morris Equipment is performing the work to the entire satisfaction of both the contractor and the city engineers.

Many communities are faced with a similar problem from time to time. Whenever reservoirs or park lakes are to be cleansed, deepened or enlarged or where swamps are to be drained, a Morris Hydraulic Dredge will do the work quicker and at less cost than by any other method. Morris Dredges can be furnished for any operating conditions, and frequently the long-experienced Morris Engineers can point the way to unexpected economies in the selection of equipment and methods of doing the work. Authoritative recommendations will be offered without charge or obligation if you will send details of improvements of this nature being contemplated by your municipality.

Morris Machine Works, Baldwinsville, New York

Branches in principal cities

MORRIS

CENTRIFUGAL PUMPS

Tests and Analyses Necessary at Sewage Works

THERE are three main objects in making tests and analyses of sewage treatment work: (1) for control of operation; (2) for record of accomplishment; and (3) for research investigations. The number and kind of analytical determinations and tests will vary with the size and type of work. The following suggestions are from a committee of the Sanitary Engineering Section, American Society of Civil Engineers:

For small plants the routine tests may be confined to those required for control of operation. For larger plants, especially where litigation may arise, it is important to do more laboratory work than is required for the control of operation alone. Data should be obtained not only for studying the efficiency of the plant, but also for comparison with similar data from other plants. At large sewage works, especially where there are problems involving improvements or enlargements to the plant, for the recovery of by-products, research work should be carried on.

Sewage Flow and Population Served

It is very important that a continuous record of the sewage flow be kept. Where venturi meters have not been installed, the use of weirs, or some other means, should be resorted to in order to determine the sewage flow. The quantity and time of by-passing sewage around all or any part of the sewage work should be noted. During storms, the volume of storm-water which does not receive treatment should be recorded. Where an appreciable quantity of industrial wastes is treated, the volume, character and equivalent population load should be determined.

Screening

For the control of the operation of screens, the quantity of sewage screened and the volume of screenings obtained should be determined. The time that the screens are in service, the work required from them, and their power consumption, should be noted. For a record of accomplishment, the screenings, where possible, should be weighed and the water content determined. The amount of solids removed from the sewage can then be computed. The efficiency of screening in removing suspended solids is accurately determined by adding to the weight of suspended solids determined in the screen effluent, the weight of dry solids in the screenings from a corresponding volume of sewage, and computing the percentage of solids removed by the screens. By determining the loss on ignition of the suspended solids in the effluent and of the solids in the screenings, the percentage removal of organic matter can be estimated in a similar manner.

Sedimentation

A minimum requirement for the control of treatment by sedimentation should be the conical measuring-glass test for the volume of settleable solids in the influent and effluent. The quantity of sewage and the volume of accumulated sludge are also important factors in the control of the treatment. For the record of accomplishment, the removal of suspended solids, by weight, should be ascertained by gravimetric determination of suspended solids in the influent and in the effluent. It is also important to determine the removal of organic matter. This may be done by determining the organic nitrogen or albuminoid nitrogen and oxygen consumed in the influent and the effluent. The reduction in biochemical oxygen demand has come to be considered an important index in the purification accomplished. Tests for dissolved oxygen in the influent and the effluent should be made with sufficient frequency to show whether the sewage has become septic.

Trickling Filter Treatment

Relative stability tests of the effluent are desirable for the control of operation of trickling filters. The volumetric determination of settleable solids in the sewage applied and in the effluent is an index of the extent of the storage or unloading of solids in the filters. The volume of sewage treated by the filters and the condition of the filters with respect to clogging are also important factors in the control of operation. For a record of accomplishment, the reduction in organic matter can be ascertained by determining the organic nitrogen or albuminoid nitrogen and oxygen consumed, or biochemical oxygen demand in the influent and the effluent. The extent of oxidation is further shown by reduction in free ammonia nitrogen and increase in nitrogen as nitrites and nitrates. Where trickling filter effluents are passed through sedimentation tanks, the same determinations should be made of the tank effluent that have been recommended for filter effluent. The suspended solids in the trickling filter effluent and the tank effluent should be determined gravimetrically. The dissolved oxygen in the effluent before and after sedimentation will indicate not only the degree of oxidation but also the effect of the sludge in the sedimentation tank.

Activated Sludge Treatment

For the control of activated sludge treatment, the flow of sewage, the proportion of activated sludge returned to the sewage, the volume of air applied, and the amount of power used, are important factors. The proportion of activated sludge present can be determined by sedimentation tests or more quickly by the centrifuge. A knowledge of the amount of solids in the sludge by weight is also important in the control of treatment. Tests for turbidity, suspended matter and relative stability should be made on the effluent after sedimentation. The sludge settled in the sedimentation tanks should be kept under control by measuring the depth of sludge in the tanks and by observing the character of the sludge returned. For a record of accomplishment, in addition to these tests, determination of total nitrogen or albuminoid nitrogen and oxygen consumed or all biochemical oxygen demand should be made on the sewage and the effluent. The extent of oxidation is indicated by determination of free ammonia nitrogen and nitrogen as nitrates, and dissolved oxygen in the effluent.

Disinfection

Tests for the control of disinfection should be made for residual chlorine after an adequate period of contact. For a record of accomplishment, bacteria counts and B. coli tests should be made before and after disinfection. In some cases it will be desirable to determine the reduction in biochemical oxygen demand accomplished by disinfection. The quantity of chlorine applied should be noted. For reasons of economy it may be desirable to vary the dosage of chlorine to correspond with the chlorine demand of the sewage.

Sludge Digestion

For the control of sludge digestion, the appearance and odor of the sludge and the reaction of pH index during digestion are important. Temperature is also important, especially where control is exercised over it. For a record of accomplishment, the total solids and organic matter by loss on ignition should be determined of the raw and digested sludge in order to ascertain the proper volume to withdraw. Where gas is collected, it is desirable to obtain its volume and composition. A record should be kept of the volume and character of the sludge liquor discharged from separate sludge digestion tanks.

(To be continued in the March issue)

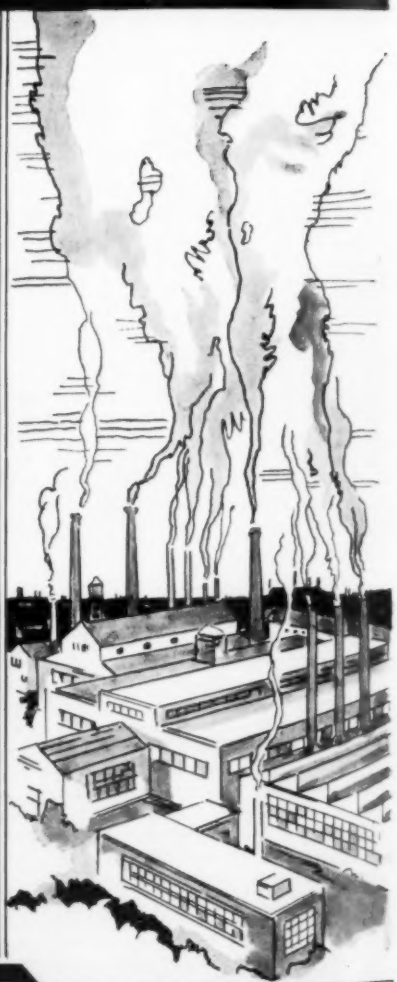
SUPERIOR DIESELS

The intrinsic value of modern design, rugged construction, highest quality materials and workmanship, and a background of forty-five years engine building experience with unexcelled manufacturing facilities, enables Superior Diesel Engines to create new standards of performance and economy.

These modern Diesels are built in sizes from 65 to 840 rated horsepower, in two to eight cylinder models, to meet practically any industrial power specification; also smaller horsepowers built for portable and semi-portable service.

Bulletin No. 120-X sent free upon request

SUPERIOR ENGINE COMPANY
SPRINGFIELD, OHIO



WALTER HEIMBUECHER
City Engineer
University City, Mo.

CARL SCHNEIDER
Mechanical Engr., Dept., Public Property, Div. of Public Works
New Orleans, La.

JAMES D. TRACY
Supt., Garbage Bureau
Erie, Pa.

W. H. RIEHL
City Engineer
Stratford, Ont.

PHILIP A. MERIAN
City Engineer
New Britain, Conn.

Who's Who among Sanitation Officials

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

JAMES GARBERG
Supt. of Streets
Minneapolis, Minn.

ARTHUR P. HEYER
Director of Public Works
Montclair, N. J.

A. M. SOBY
Chief, Bureau of Street Cleaning
Philadelphia, Pa.

EDW. H. GERLACH
Supervisor, Garbage and Ash Collection
Milwaukee, Wis.

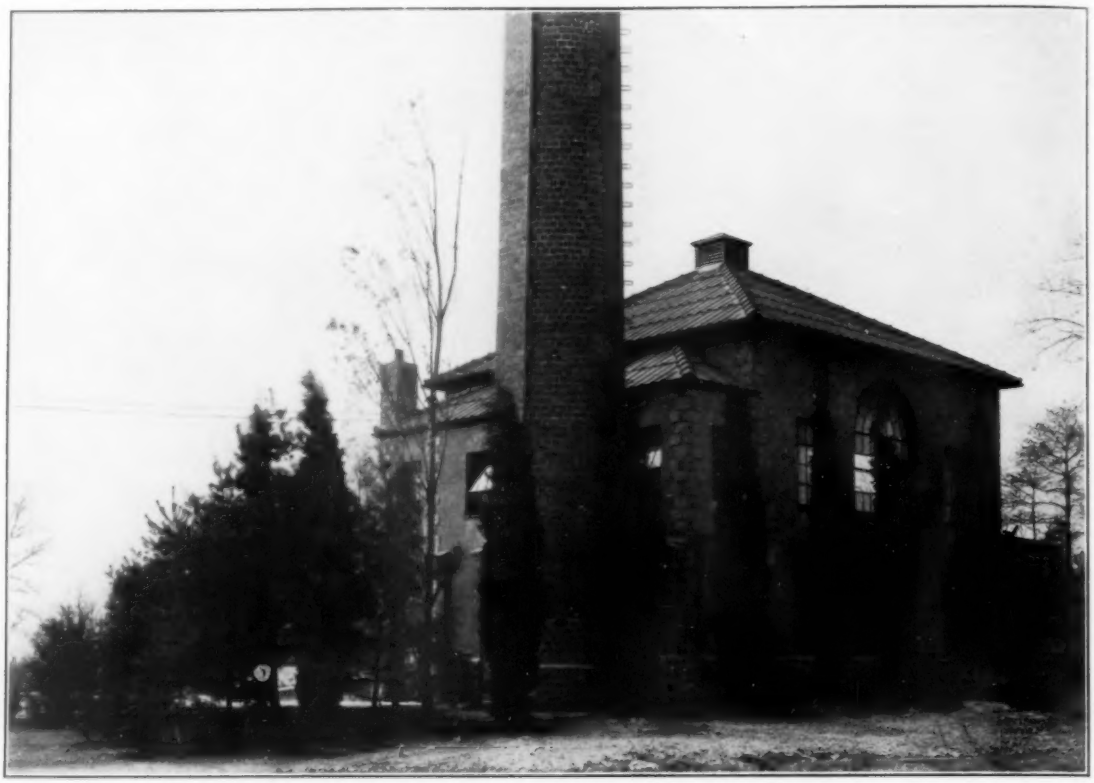
M. C. GEAREN
Supt., City Incinerator
Racine, Wis.

COLVER L. SAUNDERS
Supt., Sewer Maintenance
Dept. of Public Works
Providence, R. I.

IRVING STONE
Supt., Incinerator Dept.
Providence, R. I.

JOSEPH J. PETRANEK
Commissioner of Public Works
Cicero, Ill.

W. H. CARRIGG
Supt. of Sanitation
Sioux City, Iowa



Exterior rear view—Pelham Manor, N. Y.

Completed in November, 1931—this "Pittsburgh-Des Moines" Incinerator serves Pelham Manor, North Pelham and Pelham

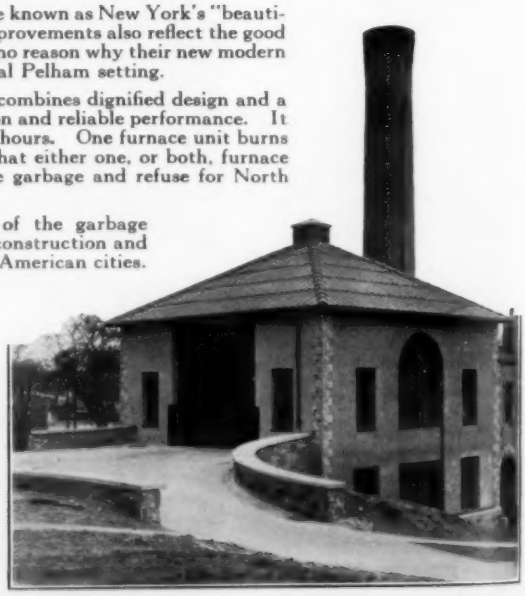
The Pelham communities in lower Westchester county are known as New York's "beautiful homes" district. Their municipal buildings and civic improvements also reflect the good taste and refinement of these exclusive suburbs. There was no reason why their new modern incinerator should not harmonize effectively with the typical Pelham setting.

This "Pittsburgh-Des Moines" plant at Pelham Manor combines dignified design and a restful setting with the practical benefits of low cost operation and reliable performance. It has a two unit furnace with a total capacity of 25 tons in 8 hours. One furnace unit burns 16⅔ tons; the other unit burns 8⅓ tons per 8 hours—so that either one, or both, furnace units can be operated as required. It also disposes of the garbage and refuse for North Pelham and Pelham.

The "Pittsburgh-Des Moines" plant burns all of the garbage as fuel to give low operating costs. Its practical construction and improved design have been proved in many clean American cities.

Interior view showing sturdy furnace construction—Pelham Manor, N. Y.

Get the facts. Write today for catalog, "Municipal Refuse Incineration." It gives interesting collection and disposal cost data for various cities and describes the design, construction and operating principles of the "Pittsburgh-Des Moines."



Exterior front view—Pelham Manor, N. Y.

Pittsburgh-Des Moines Steel Company

Room 941, 270 Broadway, New York, N. Y. **3452 Neville Island, Pittsburgh, Pa.**

Chicago **Atlanta** **Dallas** **Des Moines** **San Francisco** **Seattle**

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Milledgeville, Ga.

The city of Milledgeville, population 5,534, uses two 1½-ton motor trucks for the collection of garbage, which is disposed of on a special dump.—T. J. THOMAS, Superintendent of Streets.

Nampa, Idaho

A contractor collects all of the garbage of Nampa, population 8,206, using one 1½-ton truck. The collection and service are handled free to the city because of the food value of the garbage, most of which is fed to hogs. The remainder is burned by the contractor.—EDWARD HEDDEN, City Engineer.

Centralia, Ill.

A contractor paid by the city of Centralia, population 12,583, collects all of the garbage with two 2-ton box body trucks. The garbage is fed to hogs as the most expedient method of disposal in this locality.—JAMES MAXFIELD, City Clerk.

Chicago, Ill.

The city of Chicago, population 3,376,438, uses some rented 5-ton trucks for the collection of garbage, and a total of 635 trailers, which are hauled in train by 145 tractors. The garbage is disposed of by incineration and dumping. It is expected that when funds are available two more incinerators will be built to supplement the one incinerator which is now in service.—G. B. ROBISON, Assistant City Engineer.

Kankakee, Ill.

The city of Kankakee, population 20,620, uses two 6-ton wagons and one 2-cubic-yard truck for the collection of garbage. This waste material is disposed of by feeding to hogs.—C. H. DEUSEHLE, Superintendent of Streets.

River Forest, Ill.

The city of River Forest, population 8,829, pays a contractor to collect all garbage within the corporate limits. The contractor uses four motor trucks, three of which are 1½-ton units and one a 3-ton truck. The garbage is disposed of by incineration, a total of 10 tons being burned each day.—WILLIAM H. FRENCH, Superintendent of Public Works.

Rock Island, Ill.

The city of Rock Island, population 37,953, owns six motor trucks, three of which have 3½-yard bodies and the remaining three 4½-yard bodies, for the collection of garbage, which is disposed of by incineration.—ERNEST RUSS, Health Officer.

East Chicago, Ind.

The city of East Chicago, population 54,784, handles the collection of garbage by a municipally owned fleet of trucks. There are two 3½-ton 5-yard trucks and six 2-ton, 4-yard trucks in this fleet. The garbage is disposed of by incineration.—ABE PITZELE, Street Commissioner.

Michigan City, Ind.

Michigan City, population 26,735, pays a contractor for the collection of garbage. He uses five 2½-ton trucks for the collection service and disposes of the waste material by feeding to hogs.—EDWARD J. HEISE, City Clerk.

Cedar Rapids, Iowa

The city of Cedar Rapids, population 56,097, collects the garbage of the entire city, using ten motor trucks of 1½ tons capacity with 3-yard bodies. The garbage is disposed of by sanitary fill in ravines, being placed in layers and covered with earth.—A. KLUSTY, Assistant Health Officer.

Des Moines, Iowa

The city of Des Moines, population 142,559, uses a fleet of motor trucks for the collection of garbage throughout the city. This fleet consists of three 3-ton, seven 2-ton, one 1½-ton and two 1-ton trucks, and one Ford delivery truck as well as one Ford sedan for the superintendent in charge of collection. All garbage is delivered to a private hog farm.—REX D. BROWN, Secretary, Public Safety Department.

Dubuque, Iowa

The city of Dubuque, population 41,679, pays a contractor for the collection of all garbage in the city. The contractor uses twelve 3- to 5-cubic-yard wagons and three 6-yard motor trucks. The garbage is disposed of by reduction. Only pure garbage is taken by the contractor for the purpose of rendering and extracting the grease and fertilizer compounds; the remaining refuse, ashes, rubbish and street sweepings, grass, leaves, branches, etc., is picked up by the Street Department and disposed of at different dumps throughout the city.—E. T. FRITH, Frith's Fertilizer Works.

Fort Thomas, Ky.

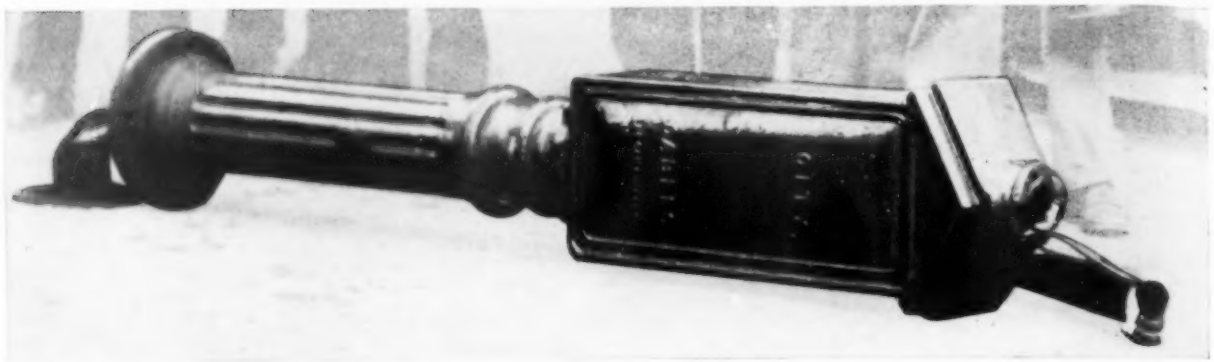
The city of Fort Thomas, population 10,008, uses one 6-yard and one 4-yard motor truck for the collection of garbage, which is disposed of by incineration.—CHARLES H. KUHN, City Engineer.

Hog Feeding with Garbage *and* Incineration and Garbage Disposal Developments in 1931
See the 1932 Municipal Index

THREE NEW UNITS ADDED TO THE FLEET OF TRUCKS USED TO COLLECT GARBAGE IN AKRON, OHIO

The center unit is a Sterling truck on which is mounted a Heil No. 3 hoist and a 4-cubic-yard body. The two Fords are equipped with No. 3 Heil hoists and 3½-cubic-yard bodies. To obtain the lowest possible mountings, the body floor is curved over the rear wheels

3-FOLD *features*
SAFEGUARD FIRE ALARM SYSTEM *against this—*



Motor Vehicle Accidents No Longer Hazard the Receipt of Fire Alarms

Accidents will happen to fire alarm pedestals as a result of either careless or drunken driving of motor vehicles. One city reports an average of 70 pedestals a year disabled from this cause—another smaller city had approximately seventeen such accidents in a twelve-month period. The two photographs shown here were taken in one municipality; the pedestal in the upper view, having been knocked down *twice* in *one* month by trucks.

"A BOX A BLOCK"

In the past when a pedestal was knocked down, generally several fire alarm circuits were crippled, and scores of fire alarm boxes put out of commission for a short period, until the damage could be repaired. Now, the new 3-FOLD principle of fire alarm transmission and reception—being introduced to offset this condition and many others which were once hazardous to the receipt of fire alarms—is provided in both boxes and central office equipment of the latest Gamewell design. Complete new 3-FOLD fire alarm systems can be furnished or if your present single-fold system is of recent installation, it can be equipped with many of the 3-FOLD features.

Gamewell sales engineers are located at convenient points around the country. The one nearest to your city will be glad to explain our 3-FOLD system in more detail, and show you how it can be applied to your needs. A letter to our factory will bring him, without obligation to you or your city.

THE GAMEWELL COMPANY

NEWTON, MASSACHUSETTS

"A Box A Block"

Police and Fire Protection Items

of Interest to Departments of Public Safety

Policemen Study Their Profession

THE Police School of the Boston, Mass., Police Department is now in session and will run until March 31. The term began on November 16, 1931, under orders from Police Commissioner Eugene C. Hultman, who is designated as the President of the school. Police Superintendent Michael H. Crowley is the Dean and Deputy Superintendent Thomas F. Goode is Chairman of the Administrative Board.

The faculty is composed of senior members of the Department and the subjects covered in the lectures include court procedure, discipline and deportment, report writing, hackney (taxicab) licenses, arrests with and without warrants, care and use of Department firearms and tear gas equipment, motor vehicles stolen, abandoned, etc., drugs and narcotics, identification, including finger-printing and photographing, detective work, and traffic regulation.

At the close of each lecture a printed slip containing ten questions is given each student officer, and these slips correctly filled out must be returned at the time of the next lecture.

The first term consists of 18 lectures and the men as designated attend on their off-duty shift. There are separate classes and different lectures for patrolmen and officers. Patrolmen 60 years or more in age are not required to attend the classes, but may do so voluntarily.

The attendance at the night classes has averaged 220 men and about 150 in the day classes. A large room on the fourth floor of the Police Headquarters Building is used as a class room, being fitted with a blackboard and arm rest desk seats.

The lectures on "Court Procedure" are subdivided as follows: Outstanding Faults of Police Officers in Court Procedure; Applications for Warrants and Summonses; Applications Not Properly Made Out; Cases not Properly Prepared for Presentation to the Court; Demeanor of Officers on Witness Stand and Manner of Giving Evidence; Unserved Default Warrants; and Courts, Evidence, and Confessions.

"Discipline and Deportment" lectures include: The Definition of Discipline; The Necessity of Discipline; Qualities of a Well-Disciplined Officer; Situations Involving Discipline; Roll Call; Salute; Definition of Deportment; Idle Talk, Profane Language, etc.

"Report Writing" includes reports on accidents, fires, complaints, lost children, missing persons, sudden deaths, sidewalk and street defects, and assignments. Samples are given of correctly written reports.

The lectures on "Hackney Licenses" embrace the regulation of taxicabs and taxicab stands.

The lecture on "Identification" includes a talk on the things to be particularly observed at the scene of a crime, and methods of obtaining finger prints and other incriminating evidence.

HARRY BELKNAP.

Fire Training in New York State

A REGIONAL plan of training firemen of the cities and villages of New York State has been in operation for three years, under the direction of the New York State Conference of Mayors and the New York State Fire Chiefs' Association. A report of this activity for the year 1931, which has recently been issued, records the increasing extent of the work and discusses various questions that it raises.

The number of schools was enlarged during the year from 16 to 18, comprising the cities equipped with training-towers. The total attendance was 2,849 firemen from 71 municipalities. The schedule of lectures was changed by the adoption of a standard fire training curriculum, consisting of the following subjects and required hours:

Courtesy, 1; Salvage, 2; Fire Prevention and Building Inspection, 3; First Aid, 2; Ventilation, 3; Simplified Hydraulics, 2; Auxiliary Equipment, 2; Method of Fighting Different Kinds of Fire, 2; Exposures, 1; Forcible Entry, 1; Care of Equipment, 2; Maintenance and Operation of Fire Apparatus, 2; Examination, 1. All firemen are also required to receive annual training in the 20 standard evolutions prescribed by the joint committee on training.

A school for instructors is being conducted annually, at least until all instructors have been trained in the standard curriculum.

The report emphasizes the importance of training-towers, saying:

"The training of firemen in New York State will not be 100 per cent efficient until each of the cities and larger villages has its own training tower and operates a school. Training-towers are not difficult or costly to construct and the expense of maintenance is negligible. An appropriation for a training-tower is one of the best investments a municipality can make. It will more than pay for itself in fire-fighting efficiency the first year. . . .

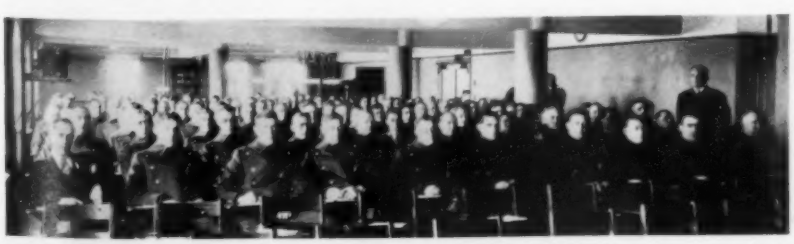
"As long as a municipality has to send its firemen to a school operated by another department, it will have to be content with a limited amount of training in the evolutions. Such training, to be fully effective, should be continuous throughout the summer and fall, and all members of a department should be required to take it."

Success of Fire Prevention Indicated by Reduced Losses

A COMMITTEE of judges has reviewed the Fire Prevention Week reports for United States cities, and has selected the city in each state telling of the best results. According to the National Fire Protection Association, 58 of the cities reporting suffered no loss by fire during the week of September 27; 73 escaped damage from burning during Fire Prevention Week, October 4-10; and 70 reported no loss the following week, making a total of 201 fireless weeks. This compares with a total of 155 fireless weeks reported in 1930. The cities submitting reports for 1931, including both those which had fireless weeks and those reporting losses, had an average reduction of 48 per cent in their fire loss for the three weeks referred to, as compared with the average weekly loss for the same cities for the previous year.

The N.F.P.A. has also announced its preliminary estimate of fire loss in the United States for the year 1931, amounting to $453,500,000, or $11,500,000 less than the preliminary estimate for 1930. The 1931 estimate is likewise a smaller total than the reported fire losses in any year since 1920, a fact which is particularly encouraging when the increase in property values is considered.

It is also reported that during the year there were 43 fires involving a loss estimated at $250,000 or more, as compared with 68 such fires during the previous year. Only 3 of the 1931 fires are regarded as in the conflagration class.



THE BOSTON POLICE SCHOOL IN SESSION

Before you buy Paint

BEFORE you buy your next supply of street marking paint, we suggest that you investigate the greater economy of Thompson Traffic Markers. During a time when most municipal budgets are being drastically cut, many far-sighted American cities are adopting this *perfected* marker at a real saving over the cost of constant re-painting.

Forged in one piece from a special aluminum-manganese-silicon alloy, Thompson Traffic Markers are guaranteed unbreakable in use. Of a *white* metal, they contrast strongly with any pavement, take a high polish from tire friction, and reflect light brilliantly. They give *permanent* year-round service throughout all conditions when painting is impossible.

No tying up of traffic—no waiting for favorable weather—installation in any road surface, *and for the life of the pavement.* The first moderate cost is the last.

Ask us to quote prices and to show how this modern marker pays for itself in about two years, then serves for many more at no cost whatever.

Write today for prices and complete information

Investigate

THOMPSON TRAFFIC MARKERS

Traffic Marker Division
THOMPSON PRODUCTS, INC.
CLEVELAND, OHIO

ALUMINUM ALLOY—Aluminum alloyed with manganese and silicon. Non-corrosive. Extremely resistant to abrasive wear.

SOLID FORGING—Forged from a solid slug of *malleable* metal. Non-breakable in use. *The only forged marker.*

HEAT-TREATED—Heat treatment increases wear-resistance and strength throughout.

SAFETY—Raised ribs on head protect pedestrians.

LONG LIFE—Wear as long as the pavement. Can be salvaged when street is resurfaced.

STAY PUT—Barb on long, thick stem anchors in pavement. Underhead contour prevents "creeping."

EASILY INSTALLED—Quickly done by regular street maintenance crew, with ordinary maintenance equipment.

HIGH VISIBILITY—*White* metal. Maximum visibility and reflection day or night.

WATER TIGHT—Design prevents water seepage. Malleable head conforms with contour of pavement.

RELIABLE SOURCE—Made and warranted by the country's largest manufacturer of fine automobile and airplane parts.

These Thompson Traffic Markers were installed over paint. The paint will be gone in two months. The markers will last as long as the pavement.

FEBRUARY, 1932

Vol. XLVI, No. 2

The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

City Planning as a Tribute to George Washington

By SOL BLOOM
Member of Congress;
Associate Director of the United States George Washington Bicentennial Commission

A RENAISSANCE in city planning would be an ideal tribute to the Father of His Country, particularly in this year of the George Washington Bicentennial. And when I refer to city planning I do not limit it to the mere structural phase of the movement. It should include every possible means of beautification. In my view, no city planning is complete unless it includes such features as parks, fountains, flowers and a multitude of trees. Beauty has come to be more and more a part of the national life, a source of both enjoyment and inspiration. Consequently, the perfect plan for a city should use every opportunity to increase its loveliness.

George Washington was the father of modern city planning in the United States. He was not satisfied to have the National Capital built according to a preconceived plan; he demanded that the plan be made by the man most competent to do it. That was why he engaged the services of Major L'Enfant.

That the result has justified his prophecy and his labor many times over, is universally admitted. Today, when our government is rounding out the L'Enfant plans made 140 years ago, Washington, D. C., is a place of beauty and splendor. Therefore, there could be no better way to show our appreciation of what George Washington accomplished, not only in city planning but also in many other activities, than to cause the city planning movement in America to take on new life and produce bigger results.

There are two ways in which we can do homage to Washington through city planning. One is the creation of city planning commissions in towns which have not hitherto had them. The other is for city planning commissions now in existence to increase their activities and for municipalities to make haste to put into effect the requirements of the commissions.

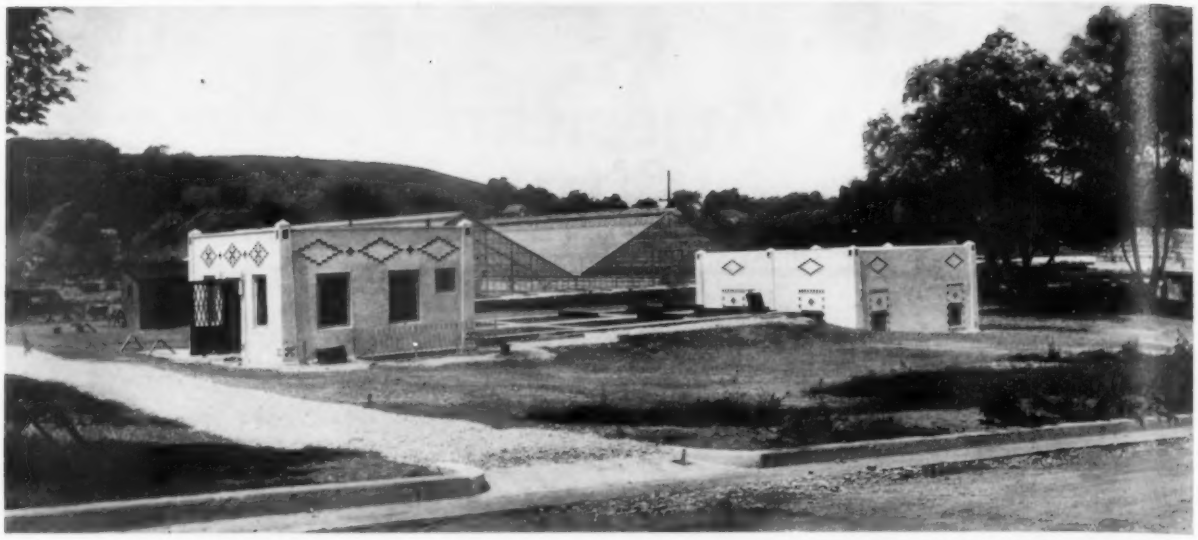
As practically everybody knows now, the celebration of the George Washington Bicentennial is to continue nine months, from February 22 until next Thanksgiving Day. Every American city, town and village will set aside, within the designated celebration period, a number of patriotic dates on which it will stage appropriate ceremonies and festivities. In fact, at this writing (January 15), 23,000 cities, towns and village have notified the Commission that they have set up their local Bicentennial commissions and have either completed or begun their programs for the entire nine months.

Any community which has not completed its program and desires help in the work can get valuable assistance by writing to the United States George Washington Bicentennial Commission, Washington Building, Washington.

But in celebrating the Bicentennial it will not be sufficient to have splendid programs. It will not be enough to have a general reanimation of the city planning movement. We must look upon these activities as a means of drawing near to George Washington in spirit. At a time when our country stands indicted before the world for far too much criminality, at a time when business depression is among us, we can find the remedy for many of our ills by acting upon the plans and ideals of the greatest of all Americans.

In that will be the great benefit and blessing of this Bicentennial Celebration. It will enable us to know Washington as he really was, to read what he wrote and said, to refresh and strengthen our spirits with a knowledge of the valor and the success with which he attacked problems and overcame difficulties.

THE L'ENFANT PLAN FOR WASHINGTON
Showing the survey made by Major Ellicott to mark the boundaries of the district, completed in 1795.



THE NEWTON, N. J., SEWAGE TREATMENT PLANT FORMS AN ATTRACTIVE ENTRANCE TO A CITY PARK

Enlarged Sewage Treatment Plant for Small City Stresses Odor Control

By **THOMAS F. BOWE**
Consulting Engineer, New York City

IT was obvious to the designer of the modern sewage plant in Newton, N. J., that with increased volumes of sewage and with the encroachment of residences around the treatment plant site, the specific requirements demanded more than a duplication of the original units.

In the selection of units or equipment for enlargement of an existing plant, consideration must be given the topography and the location of the site with respect to dwellings, volumes of sewage and varying rates of flow and requisite degree of treatment. Given two similar conditions, the personal element of the designer will materially affect the finished result.

In the design of recent plants, there are noticeably many features which contrast them with those contemporaneous with the original Newton works. Briefly, these may be stated to include separation of the various functions of the treatment into its elements—adoption of mechanical equipment, glass superstructures, collection and combustion of evolved gases, and development of the activation process. These have all contributed to economy either in plant construction or in operation, to improvement in treatment, to compactness of units, or to allaying the objections commonly associated with sewage works.

Segregation of the specific parts of the treatment may result in individual grit chamber, screen chamber, separate settling tank, digestion tank, with further division into two-stage digestion, etc. It is questionable whether complete separation of functions is practical in the smaller plant. In the enlarged Newton plant, there are examples of combination and segregation. The grit and screen chamber together with mechanism is a combined and complete unit, while filtration is two-stage—trickling filter followed by sand filtration. The former feature was adopted for compactness, the latter on account of local conditions, and both from the viewpoint of economy. Other examples of individual units in the Newton plant are separate settling tanks and digestion tank, which in reality is two-stage.

The Grit Chamber

The grit chamber consists of a small retention compartment wherein the velocity of sewage flow is reduced to 0.6 to 1.0 foot per second, causing deposition of sand, grit, coffee grounds, fruit seeds and similar material. Thereafter, the flow is directed through a bar rack with one inch clear spacing, upon which are retained rags, paper and large pieces of fruit or vegetables, which may be classed as refuse. All material accumulated within this combined unit is of such nature as would increase the difficulty of removing solids settled in the subsequent tanks.

The mechanism for removing the grit and screenings is located in the controller building and is further encased within a metal housing. The device consists of an endless chain to which are fastened semi-circular buckets with perforated bottom and with rake attachment. The buckets travel down the screen, raking the accumulated matter from the bars. Thereafter, the bucket passes through the hopper and excavates the deposited material. The excess moisture drains on the upward trip, the first

buckets, after a period when the mechanism has been inoperative, being delayed until sufficient time has elapsed for complete drainage.

The grit and screenings drop from the buckets as they are inverted at the top of the flight, a knocker and scraper being employed to completely clean them. The retained material passes down through a sloped chute to a covered concrete chamber adjacent to the building and into receptacles. Sufficient space is provided in this storage compartment for six cans, which are interchanged when full. A chain block suspended on a swinging bracket is employed to hoist the receptacles to a wheelbarrow, by which it is transported to a point for burial. Based on a short period of plant operation, 4.85 cubic feet of grit and screenings on a wet basis are being removed daily.

The Settling Tank

The new settling tank is constructed in duplicate compartments with a tank depth of 9 feet, 6 inches, each equipped with straight line collectors designed for accumulation of both settled sludge and floating material. These are pumped to the digestion tank. The settling tank is furnished with a wooden covering made up of individual 3 x 10-inch creosoted yellow pine planks. These are supported in a framework of angle irons recessed to bring the planking flush with the concrete surface of the walkways. Alternate planks are drilled with ¾-inch holes to receive a hook and thus provide means of handling. The whole surface may be exposed for maintenance or replacements, but normally is covered and screened from view.

The Pumping Station

The settled sewage returns to a wet well under the controller building after passing through a venturi tube, and is pumped to the trickling filter dosing tank. Pumps of the Wood trash design are provided in duplicate in this station and are of the vertical type with the pump in a dry well or pit and the motor on the ground floor. Motor and pump are connected with a large cast iron pipe casing, which supports the shafting and keeps all three in alignment. The operation of these units is particularly quiet and free of vibration.

Sand Filtration

The plant as originally designed provided for filtration of the tank effluent through sand beds. The inadequacy of settling facilities impaired the sand surfaces to such a degree that they were unable to serve for even normal rates of application. The beds, being constantly ponded and in a septic condition, were particularly objectionable to sight and smell. The construction of additional sand area was considered in conjunction with improved settling. The high cost of new beds, due to local topography, the large maintenance cost involved, together with the inherent possibility of odor at times of poor tank clarification, indicated the inadvisability of this procedure. A good quality of quartz rock was available from a local quarry at a reasonable figure which, coupled with the simplicity of operation and dependability to be expected, influenced the selection of the trickling filter as an intermediate stage of clarification. In this manner the original area of sand, placed in proper condition, was made to serve for the prevailing and design flows.

The Trickling Filter

In view of the adoption of trickling filters, special precaution had to be observed by equipping the bed with a glass superstructure to insure against possible dissemination of odors from the sprays or the spreading of flies or moths characteristic of these filters. Other valuable features of the glass covering are control of ventilation and maintenance of warmer temperatures, particularly desirable in winter. This structure was furnished by Hitchings and Company under a separate contract.

The glass covers an area 94 x 106 feet and is designed in two spans, the supports being the dividing and exterior walls. The central valley is drained with downspouts extending to the stone surface. Truss members are welded and the entire structure painted with three coats of aluminum bronze paint made up in accordance with the Aluminum Company of America specification.

The enclosure has been effective in rapidly building up the growth on the filter medium and has fulfilled all other expectations. The effluent after settling is clear and readily filters through sand, disappearing immediately after application.

The Dosing Tank Unit

Dosing tanks of the twin type are located in the upper portion of a three-deck unit, the final tanks below grade furnishing the foundation, and the space in between forming rooms for the chlorinators, secondary pump motors and tool room.

The final or secondary settling tank in two compartments is equipped with sludge collectors. Complete removal of solids accumulating within this tank is of importance where a good quality effluent is required, as in this case. The probability of odor nuisance would be great if suspended material in large quantities were carried with the effluent and exposed upon the sand beds. The trickling filter covering promotes a more even and continuous sloughing from the filters, which, coupled with effective settling, assures a non-septic and clear liquid to apply upon the sand area. The sludge retained in the secondary tank is likewise directed to the digestion tank.

The Digestion Tank

The original septic tanks, two in number, were altered to serve as digestion tanks. Fresh solids are deposited at one end of the larger tank, the material resettles and is stored therein. The old effluent end is closed, requiring liquid to flow through the entire length of the smaller tank before displacement at the opposite end. The larger tank serves as the storage and digestion tank, and the smaller tank serves as a resettling unit for the supernatant liquid as well as for digested sludge which is displaced from the larger tank. The length of travel from entry to displacement is 166 feet. Liquids discharged from the digestion tanks is diluted with a large volume of the secondary tank effluent and passed through sand.

The tanks are constructed with a concrete roofing having circular manhole openings at advantageous points. It is planned to place cast iron gas collection domes at these openings and carry the evolved tank gases to a point for combustion. No decision has been made as to the use which will be made of the heat generated, the main purpose being destruction of the gases, hence elimination of odor from this source.

A plunger pump with suitable piping arrangement permits circuation of the sludge or its delivery to the drying bed.

The Sludge Bed

The sludge drying bed is of new construction having a glass superstructure similar to that over the filter. The bed is made up of graded layers of crushed stone to a depth of 9 inches, surfaced with 6 inches of coarse sand and under-drained with laterals of 4-inch open joint tile laid on 9-foot centers connected with an 8-inch main drain. The drainage from the sludge bed is settled and dosed with hypochlorite solution before discharge to the stream.

Chlorination

Chlorine is utilized for odor control as well as for sterilization of the final effluent when it is necessary to by-pass the sand treatment.

The raw sewage is chlorinated with dosages of 6 to 7 p.p.m. at the grit and screen chamber, and owing to the "fresh" condition of the sewage and the efficiency of the mechanically clarified grit and screen chamber as well as the settling tank residual, chlorine may be detected in the trickling filter sprays.

The second application of chlorine is made ahead of the final settling tank, and as the effluent is normally passed through sand, may also be classed as for odor control. For this purpose 5 p.p.m. are utilized. When by-passed to the stream direct, heavier doses are given.

Two vacuum solution feed machines installed in a separate room of the dosing tank unit, are employed for chlorination. A dormant scale is utilized for weighing the chlorine and ample space provided for storage of tanks.

The Secondary Pumps

The secondary pumps located in the dosing tank unit are identical with those within the controller house. The storage and dry wells are at one end of the final settling tank, the wet well being arranged to overflow to the outfall line in case of discontinuance of power. The pumps are arranged to deliver the clarified liquid to the original dosing tank, where five plural siphons alternate the flow between the sand beds.

The adoption of two-stage pumping instead of one large lift was determined from the trickling filter design, which would have had to be elevated an additional 7 feet, necessitating expensive concrete pile foundations and a large amount of fill. Furthermore, the elevated unit would detract from the appearance of the works and would require pumping the full height at times of partial treatment. As arranged, a saving will be realized during these periods.

Summary of the Odor Control Feature

The raw sewage is chlorinated as it enters, and a residual is maintained throughout the plant. The grit and screenings are removed in encased machinery and deposited within a covered chamber. The settling tanks are provided with coverings, and mechanical clarification is employed to prevent septic action within these units. The trickling filter sprays and sludge bed are provided with a glass superstructure. The liquid applied upon the sand beds is well clarified and quickly passes through the sand. The digestion tanks have a concrete roof and with the addition of gas collection will obviate possible odors from this source. Planting of shrubs was included in the contract and awaits seasonable weather. These features are adequate to prevent and control such odors as might arise from the various functions of the treatment. In addition to these necessary precautions, the structures have been attractively designed and are in keeping with the adjacent residences. The controller house and dosing tank building are finished in a white stucco ornamented with a design in black glazed tile. The aluminum painted glass coverings add materially to the appearance of the plant and aid in dispelling objections of an imaginary origin. The banks and horizontal areas are seeded, while the driveway is of white quartz. The site offers further possibilities for additional landscaping, which is warranted in that it forms a gateway to the municipal park and playground.

Personnel

The works were designed by John G. Albertson under the direction of the author as consulting engineer. Merritt-Chapman and Scott Corporation held the contract for the alterations and extensions, which were executed through the agency of R.T. and C.D. Stewart Contracting Co.

$500 or Imprisonment for Smoking Chimneys

AN ordinance has just been passed in Grand Haven, Mich., regulating chimneys, smokestacks, and other smoke sources as follows:

"SECTION 1. The emission of dense smoke, soot, cinders or other deleterious substances or matter from any smokestack or chimney used in connection with any steam boiler, building or any structure, or in any building used as a factory, or for any purpose of trade, or for any other purpose whatever within said city, shall be and is hereby declared a public nuisance; *provided*, that nothing herein contained shall be construed as applied to chimneys of buildings used exclusively for private residences.

"SECTION 2. The owner, agent, lessee or occupant (and in case such owner, agent, lessee or occupant is a corporation, the President, General Manager and Superintendent of such corporation, as well as such corporation) of any building or structure of any description from the smokestack or chimney of which there is emitted such dense smoke, soot, cinder or other deleterious substances or matter, within said city, shall severally be deemed and held to be guilty of creating a public nuisance and of violating the provisions of this ordinance.

"SECTION 3. The provisions of this ordinance shall not apply to the escape of dense smoke, soot, cinders, and other deleterious substances or matter from any stack, flue or chimney for a period of not exceeding ten minutes during the time when a fire box or a furnace is necessarily being cleaned out or a new fire built, but . . . . [not] oftener than once in six consecutive hours.

"SECTION 4. The continuance of such nuisance as herein contained may be restrained by proceedings in the Circuit Court for the County of Ottawa, in Chancery, upon the petition of the City Manager, but the institution of such abatement proceedings shall not be a bar to the arrest and prosecution of any person, firm, company, or corporation violating the provisions of this ordinance, or of any suit to recover such penalty in an action at law.

"SECTION 5. Any person violating any of the provisions of this ordinance shall upon conviction thereof before any court of competent jurisdiction be punished by a fine not exceeding one hundred dollars ($100.00) and costs of prosecution or by imprisonment in the County jail of Ottawa County for a period of not exceeding ninety days, or by both such fine and imprisonment in the discretion of the court trying the offender."

J. NYHOF POEL,
City Clerk.

Cleaning an Impounding Reservoir with a Suction Dredge

THE VEST POCKET DREDGE AT WORK

The Division of Water, Department of Public Works, Newark, N. J., Uses a "Vest Pocket" Unit Which Can Be Knocked Down for Cross-Country Hauling

DEPOSITS of organic matter and mud in the Macopin intake reservoir of the Newark, N. J., water supply have been causing turbidity in the water which has settled out in the distribution system. This reservoir, which is about 1,700 feet long and has a maximum width of 465 feet, has a water surface of about 12 acres and a capacity of about 32,000,000 gallons. It is used as a collecting and settling basin impounding the water discharged from the upper storage reservoirs of the Pequannock watershed. These deposits, which vary from less than 1 inch to over 4 feet in depth, are too inert to remove by straight suction, so that a small dredge was designed combining suction and cutter methods supplemented by hydraulic giants to wash down the thin deposit from rocks that are exposed when the level of the water in the reservoir is drawn down.

A "vest pocket" suction dredge, the smallest ever built with cutter machinery, has recently been delivered to the Division of Water of the Department of Public Works in Newark for this clean-up. The electrically welded steel hull of this midget, though only 31 feet long and with a 14-foot beam and a 2-foot draft, is trussed internally like a bridge and carries the machinery for a full-size 6-inch suction dredge of standard design. The hull is made in two pontoon sections, to be bolted together in the water, and is light enough to be trucked "knocked down" to any land-locked water supply, and strong enough to withstand the rigors of launching with a shove overboard. This equipment will dig to a depth of 10 feet below water, and it is now removing some 26,000 cubic yards of mud, sand and leaf mold from Macopin intake reservoir, where the deposit has been accumulating since the last cleaning in 1905.

The Truss-Weld hull in two sections, each 31 x 7 x 3 feet, was transported by truck, launched into the reservoir and bolted up, making one hull 31 x 14 x 3 feet, upon which the pump and all other dredge equipment were installed. The conditions under which the dredge operates necessitated the very shallow draft of 2 feet. This in turn resulted in high stresses in the hull, and as no repair facilities exist at the place of operation, a hull which would be practically permanently leak-proof was important. The type of construction used combines not only a higher structural efficiency, but a substantial reduction in weight, and hence greater portability as compared with other methods of riveted or welded shipbuilding.

The Equipment

The hydraulic equipment consists of a gasoline-engine-driven pump, delivering 1,000 gallons per minute, with three 1¼-inch nozzles at 92 pounds pressure. The engine is a 6-cylinder, 4¾ x 6-inch unit rated at 90 horsepower. The auxiliary equipment includes about 2,500 feet of piping with the necessary fittings, high-pressure hose lines and nozzles. The area to be scoured with the three nozzle streams is so extensive and the amount of deposit to be removed at any given place so small, that manual operation is necessary. The bottom cleaning by this method has progressed with great rapidity, and the completed portion gives the impression of having been scoured.

The Morris dredge pump has a 6-inch suction and a 6-inch discharge and consists of an outer casing and a complete inner casing of manganese steel. Manganese steel was also used for all the wearing parts of the pump, for it

THE HYDRAULIC EQUIPMENT AT WORK SCOURING SOME OF THE DEPOSIT FROM THE EXPOSED ROCKS

was recognized that the dredge would necessarily pick up a number of fairly large boulders and that this material would best withstand the shock. The pump is direct-connected to a 112-horsepower, 6-cylinder gasoline engine with 6 x 7¼-inch cylinders. The pump, designed and tested for 1,250 gallons per minute against a 125-foot total head, has a capacity of up to 3,200 gallons per minute against a 20-foot head.

The suction dredge is maneuvered with a 5-drum winch, driven by a 4-cylinder 2¾ x 4-inch gasoline engine. An engine of identical size drives the cutter equipment, which is of standard Morris Machine Works design. The general service centrifugal pumping unit has a capacity of 60 gallons per minute against a total head of 75 feet and is driven by a 3-horsepower air-cooled engine.

The "A" frame, spud frame and gallows frame of the dredge are of steel. The wooden deck house is of sectional construction, readily knocked down for removal to other locations as required.

The discharging piping is 8-inch inside diameter throughout and consists of fifteen 30-foot pontoons, two pontoon elbows, two 10-foot pontoons, and 1,320 lineal feet of 8-inch shore piping.

Personnel

The Truss-Weld dredge hull was supplied by Pierce J. McAuliffe, New York, and was designed and manufactured by United Dry Docks, Inc., New York, from the specifications prepared by James W. Costello, Chief Engineer, Board of Public Works, Newark, N. J., and Herman Rosentretor, Engineer, Division of Water, Newark. All piping was made by the Naylor Pipe Co., of Chicago, Ill., of Toncan iron spiral weld, and the shore piping is equipped with Victaulic couplings.

Municipal Truck Efficiency Increased in Norfolk

By **GLEN LEET**
Office of the City Manager

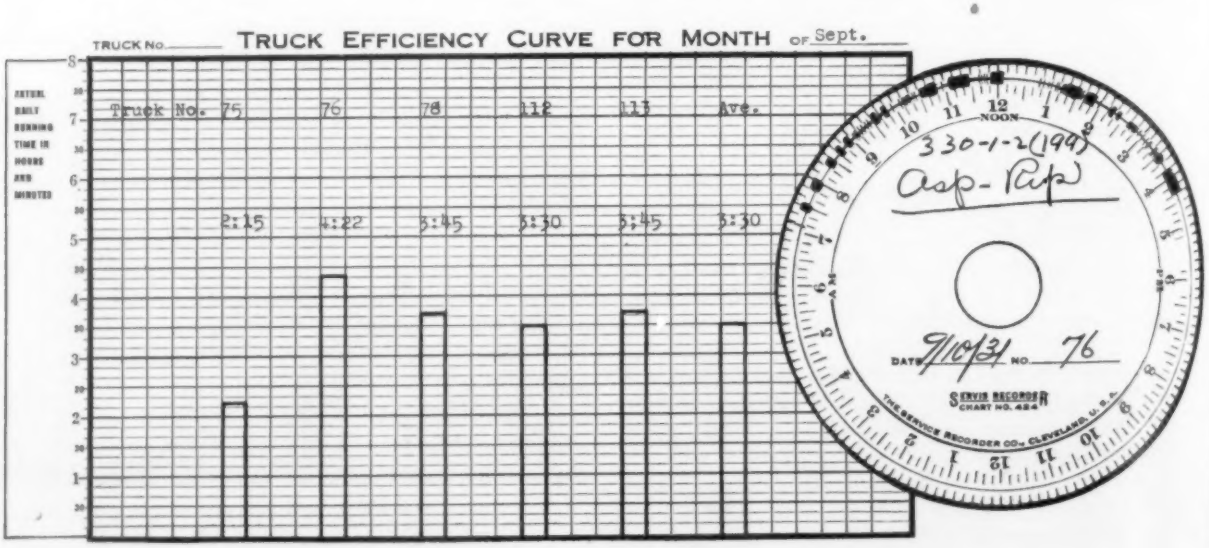
THE city of Norfolk has been enabled to make more effective use of its trucks by the use of activity recording devices. This device consists of a simple mechanism screwed to the dashboard into which is locked a paraffin-coated disk which revolves by clockwork. As this disk revolves, a line is drawn on it by a pen. The character of the vehicle's activity is indicated by this line. When the truck is in motion, a heavy line is recorded, and when the truck is not in motion, a thin line is recorded. The position of the line indicates the time of day at which it was produced.

These devices have been of considerable value in facilitating control over equipment and have resulted in considerable economy of operation. They give accurate information as to whether equipment is being used to capacity, and facilitate its most advantageous use. They permit immediate detection of any unauthorized night use of equipment, and show whether the drivers are "knocking off" work early.

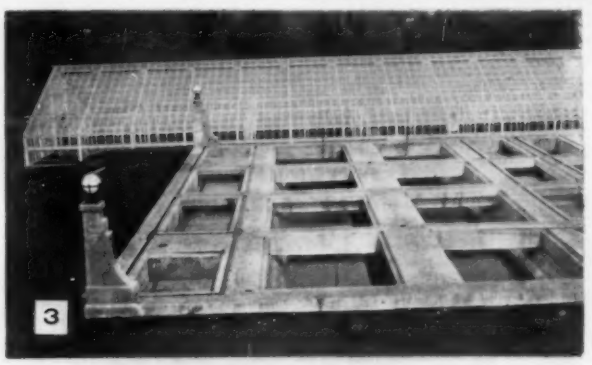
The records of five trucks used by the Highway Division in Norfolk during September, 1931, were analyzed. The average time in active service for individual trucks varied from two hours and fifteen minutes to four hours and twenty-two minutes, the average for all trucks being three and a half hours as shown on the accompanying chart.

The greatest value of these records is in their moral effect on the drivers, who know that every moment they are creating an accurate, permanent record which indicates just how much the truck was in active service.

The head of the Highway Division and the Director of Public Works both agree that the use of these devices has been instrumental in promoting efficiency and economy in their work.



Starting a New Sewage Disposal Plant



SEWER OPERATIONS AND THE NEW PLANT

1. The trencher at work just after jumping a water service line. 2. Backfilling. Note the Y-branch location stakes just under the surface. 3. Part of the new Imhoff tank and covered sludge drying bed from the top of the screen house

By **STIRLING L. WILLIAMSON**
City Engineer, Charlottesville, Va.

CHARLOTTESVILLE is so laid out and developed and its topography is such as to have necessitated the handling of sewage disposal as three separate problems. The sewerage system is essentially separate, there being a few isolated cases where for one reason or another it has been necessary to combine a storm sewer with the sanitary sewer. The sewagr is practically all domestic, with the exception of some laundry wastes and occasional oils and greases.

The growth of the city in past years and an extension of the city boundaries in 1916 to cover an area of 3.85 square miles had been far ahead of new extensions, so that the Council and City Manager saw fit in 1928 to retain engineering services toreport on the sewerage system. This report, very thorough in detail, revealed the fact that not over 60 per cent of the population was being served, that there were as many as 800 dry closets in the city limits, and numerous cesspools and septic tanks constituting a menace and nuisance to a thickly populated area.

Sewer and Disposal Plant Construction

Since the spring of 1930 a very extensive sewer program has been completed, consisting of the laying of over 20 miles of new lines from 8-inch to 24-inch carrying sanitary sewer service to 98 per cent of the population, together with the construction of two disposal plants.

The two plant sites were decided upon after very careful study of the problem at hand with due consideration to future requirements. The possibility of a single plant serving the entire city was seen to have been unfeasible. Such a central plant would have necessitated pumping plants, long force mains and long and very expensive trunk line sewers. Consequently one plant was built on Moore's Creek on the southeast of the city to take the sewage from approximately 8,000 persons out of this small stream, the normal flow of which is only about 6.9 second-feet, or 4½ million gallons daily, and the dry-weather flow much less, so that one volume of raw sewage was being dumped to about five parts of normal water flow. A smaller plant has been built on the northwest of the city, serving a part of the University of Virginia and a rapidly developing high-class residential area. This plant is designed for 3,500 people, but at present only about half of that number are contributing. Formerly this sewage emptied into a small branch, resulting in obnoxious conditions.

The remainder of the sanitary wastes from a present population of approximately 8,000 is carried about a mile east of the city limits and empties into the Rivanna River, the normal flow of which is around 65 second-feet, or 42 million gallons, daily, disposal being effected by dilution.

While it was not imperative to have complete treatment and disposal at the two plants, it was deemed the wise and economical procedure at this time to prepare for partial treatment by removing the settleable solids which had been creating offensive odors and deposits along the small streams into which the raw sewage had been dumped. Partial treatment is being effected by coarse screening, prechlorination, Imhoff tanks, and glass-covered sludge drying beds.

The bar screens have 1-inch clear openings and are hand raked. Approximately 1.8 cubic feet of screenings are removed per million gallons of sewage treated, which is somewhat higher than the average plant. This can be

attributed to the 1-inch bar spacing and the flat slope of the screen, about 30° with the horizontal. The screenings are disposed of by burying. By simply covering the screenings with a light layer of top soil, decomposition and breaking down to a soil resembling rich garden soil takes place. Deep burying prevents this natural breaking down, or at least prolongs the period.

The screens are located in a small brick building which also houses the venturi meter, the chlorinating apparatus and a fairly well-equipped laboratory for making operating tests. The screened sewage then passes through the venturi tube to the Imhoff tanks, the basis of design of which is as follows:

MOORE'S CREEK PLANT—DUAL TANKS

Population served	10,000
Average daily flow	1,000,000 gallons
Average hourly rate	41,500 gallons, or 5,600 cubic feet
Area cross-section sedimentation chamber	107.8 square feet
Length	100 feet (both tanks)
Volume	10,780 cubic feet
Detention at average rate	1 hour 55 minutes
Flowing-through velocity	0.45 feet per minute
Sludge storage	27,000 cubic feet
Sludge storage per capita—18 inches below slots	2.7 cubic feet
Gas vent area (per cent tank area)	20 per cent
Sludge drying bed area	5,000 square feet
Sludge drying bed area per capita	0.5 square feet
Slope sedimentation chamber	1 to 1¼
Slope sludge storage compartment	2¼ to 1—1½ to 1

Provision is being made to collect the gas for heating purposes.

With the present contributing population of approximately 8,000, the plant is only about 80 per cent up to designed capacity and it is felt that it will undoubtedly take care of a much larger population than the 10,000 basis of design.

Starting the Plants

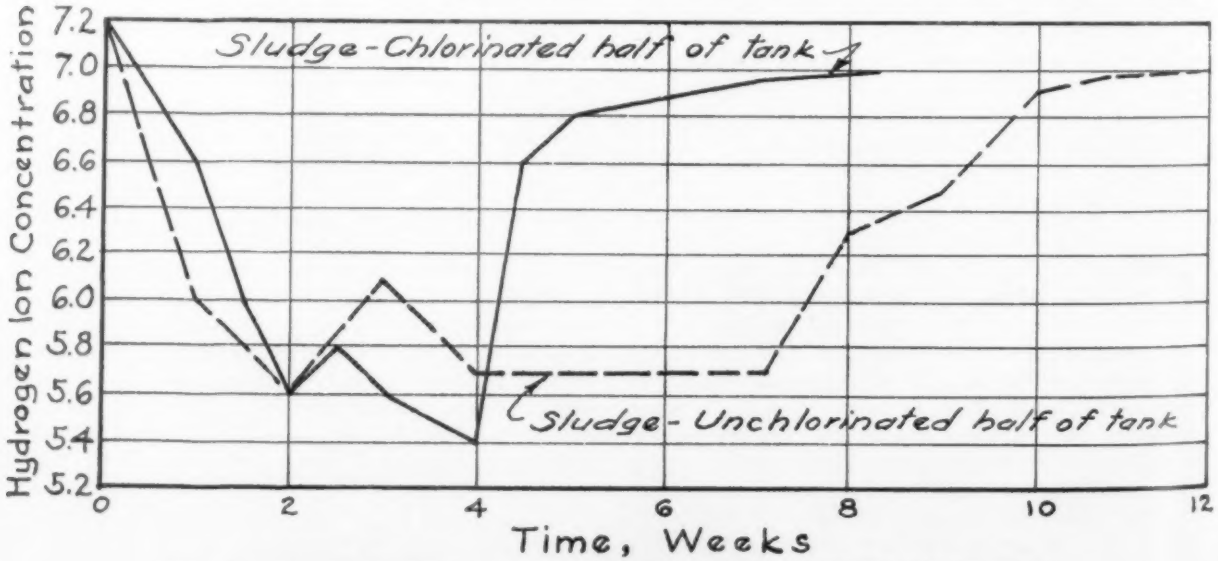
The plants were completed in February, 1931, but starting was delayed for warm weather. The Moore's Creek Imhoff tank is made up of two identical units. It was thought best to start one half of the tank first, let it run a few weeks, long enough to secure satisfactory results and to be sure that it would not run acid, turn over, or foam.

About 1,300 gallons of old sludge was secured from the Imhoff tank at Harrisonburg on April 25 to seed the plant. The sludge was trucked to Charlottesville in old 55-gallon oil drums. The trucks returned too late in the afternoon to empty the sludge, so it remained in the drums till the next morning. About ten o'clock in the morning after we had carefully laid our plans, the first drum was rolled out and a workman proceeded to unscrew the cap. As soon as the cap was unscrewed it shot out and a spattering stream of sludge like a fire steam followed. Moral—decomposing sludge *does* generate gas. This old sludge was mixed with a milk of lime solution to raise the pH from 6.8 to approximately 8.0. The total flow was then turned into this half of the tank, and although the period of detention was only a little over an hour, a very good removal of settleable solids was obtained. The percentage removed ran about 85 per cent, which must have been due to very good flow conditions in the tank, together with the soapstone lining in the sedimentation chamber.

We knew that we were loading this comparatively small amount of ripe sludge with heavy loads of fresh undigested solids daily, so that the natural tendency was for an acid sludge condition, hence we started at once to add milk of lime in quantities of 150 pounds of lime daily. This was put in through a section of 1½-inch pipe reaching all the way to the sludge, the pipe being moved frequently to insure thorough mixing and to avoid pocketing of the lime.

Activity and digestion to a small extent took place almost immediately in the tank, together with a corresponding gas production. In spite of the lime dosing, however, the sludge took an acid turn, the pH dropping below 6.0 in about two weeks' time. It continued in this acid condition for six to eight weeks, during which time gas production was also low. Lime was continuously added, the slopes were squeegeed two or three times daily, and after about two months the pH began to rise and with it the rate of gas production. We have had no way to measure the volume of gas produced, but from observation it was interesting to note the association of digestion with gas production.

Some foaming or rising of solids has been experienced from time to time but, not as violent as during the first two or three months after the tanks were started. Most of



THE pH ACTION OF THE SLUDGE IN THE CHLORINATED AND UNCHLORINATED SLUDGE OVER A 12 WEEKS

this foaming took place near the inlet end of the tank. One cause of this was that the scum boards were a little too close to the inlet, causing a downward deflection of the incoming solids and perhaps a piling-up of too much green material at the ends. The scum boards have been moved 2 feet to 6 feet from the inlet at the end of the tank. It was also observed that foaming took place after adding heavy doses of lime.

During the first week in June more sludge was shipped from the Harrisonburg plant to start the other half of the tank. A fairly good volume of sludge had been built up in the first half of the tank during the past six weeks of operation. A by-pass was connected between the sludge compartments of the two units and all sludge was mixed thoroughly throughout all hoppers with this second volume of seeded sludge from Harrisonburg.

The transfer did not disturb the condition of the tank to any great extent, and the action took a trend very similar to, but somewhat better than, that experienced in the first unit.

Effect of Prechlorination on Imhoff Tank Operation

At the time of starting this second unit the chlorinator had just been installed so that we had a good opportunity to observe the effect of prechlorination on the Imhoff tank action. In this case the results were very good. Laboratory tests at the Harvard Engineering School conducted by Messrs. Fair and Carlson indicate that prechlorination of sewage favors the rapid digestion of sewage solids. Rapid digestion in a new tank, of course, is of prime importance in order that the high proportion of raw solids to the digested may be acted on and kept as low as possible. These laboratory tests have been very well borne out by our experience in Charlottesville. We did not apply quite as much lime as was added to the first unit, but in spite of this the initial acid condition in the sludge lasted only about four or five weeks as compared with the eight or ten weeks in the unchlorinated half of the tank. The curves show more clearly the pH action of the sludge in both the chlorinated and the unchlorinated sludge. The dosage has been around 12 parts per million and a residual maintained from 0.1 to 1.5 p.p.m., depending on the time of day the samples have been taken and on the strength of the sewage.

Chlorine was first applied to the sewage after passing the screen house and before reaching the Imhoff tanks, but we have recently changed the point of application to a manhole just ahead of the screen house to keep down odors in the screen house, with very good success. Our idea of chlorination was for odor control and as a further sterilization agent to the final effluent from the Imhoff tank. At present chlorine is being drawn from 150-pound cylinders, but arrangements are being made for the handling and use of ton containers which will effect quite an economy in the cost of chlorine. We are using automatic feed vacuum type chlorinators and have had very good results. The automatic chlorinator, while more expensive in first cost than the manually operated type, will undoubtedly pay for itself in chlorine saving owing to the wide variations in sewage flow and the consequent change in chlorine demand. The venturi meters are calibrated to cover the entire range of flow and have given very good results.

Sludge Drying

The sludge drying beds are glass-covered and have the side-wall sash opening in, a feature which gives better drying advantages than the sash opening out. Ventilation is also provided along the ridge. An overhead track and trolley system has been installed through the sludge bed to facilitate the removal of the sludge after drying.

A small volume of sludge, approximately 500 cubic feet, was drawn to the beds for the first time early in November and we were much pleased with the physical appearance, absence of odor and the low moisture content. The sludge started cracking after about 24 hours on the beds and dried out rapidly. Already requests have been received from landowners for some of the dried sludge for fertilizer which would indicate some public confidence that we are "disposing of the sewage."

ACKNOWLEDGMENT.—From a paper presented before the Virginia Water and Sewage Works Association.

A Good Time for Cities to Acquire Land

IT is obvious that private ownership of urban land, with resulting speculation in land values and over intensive use of land, makes it more difficult to carry out a well-considered plan of city building. Needed public improvements are thwarted by the excessive cost of acquiring private property. Effective regulation by zoning and subdivision control is often prevented because of anticipated injury to individual owners. If a city could take advantage of the existing slump in land values to buy up the acreage needed for its future expansion, then carefully lay out this area with needed streets, parks, school sites, industrial and business locations and neighborhood units, and then dispose of the lots by lease to actual builders, the result should be a more efficient, prosperous, comfortable and attractive community. It would be a better place in which to live, and a more profitable place in which to do business.

In such a city, a lot would be leased for any purpose for which it was deemed appropriate, as indicated on the carefully worked-out zoning plan. The annual rental should be proportionate to the lot's advantage of location and to the estimated net return to be secured from its improvement. No lot would be leased except for a particular building or a particular use. The amount of the rent should be adjusted at stated intervals.

As regards urban land in the present built-up or partically built-up areas, it should be deemed to be legally "affected with a public interest" and subject to special regulation and to condemnation under special terms in the public interest. Urban land receives much of its value from the existence and activity of the organized community; and it is just and reasonable that its use should be partially subordinated to the requirements of the organized community. Only in this way can the private ownership of urban land harmonize with the public welfare and with the real or long-term interest of the land owner.

—A statement by Robert Whitten, President, American City Planning Institute, as a member of the Committee on City Planning of the American Society of Municipal Engineers.

Ridley Park, LaGrange, Ga.— An Unemployment Relief Project

By **E. S. DRAPER**

Fellow, American Society of Landscape Architects, Charlotte, N. C.

IN the heart of LaGrange, an attractive southern city of 25,000 people, there was an undeveloped tract of 10½ acres. It was the last tract of one of the early plantations, on which was once located the plantation house. With the entrance from the south terminating a wide parked street, three blocks from the Court House, and adjoining the high school and athletic field at the northwest corner, it was ideally situated for a city park, as there were no parks in this section. The Relief Association of LaGrange purchased the area and developed it during the fall of 1930 and spring of 1931, as the first of a series of parks and playgrounds.

This tract of land, while limited in extent, contained interesting features; it was quite rough topographically, with a variation of level of 85 feet between the southeast corner at the entrance and the northwest corner at its junction with the athletic field about 850 feet distant. There was a considerable outcrop of native bluestone, and a ravine heavily wooded at the north end. At the main entrance there were several fine willow oak trees. The only level portion of the property consisted of about an acre in the southwest corner, which was utilized for play purposes. Quite an interesting growth of hardwoods and pines was found on the property, concentrated at the south entrance and the ravine at the north. A giant tulip poplar tree at the east end of the ravine was a feature of interest. There are several open areas, particularly where the farmyard and outhouses of the old home were located.

The landscape architect was consulted before this property was purchased, and advised its acquisition for park purposes, for it seemed susceptible of development in several ways, to combine a number of features and uses within its boundaries.

Beauty Plus Broad Usefulness

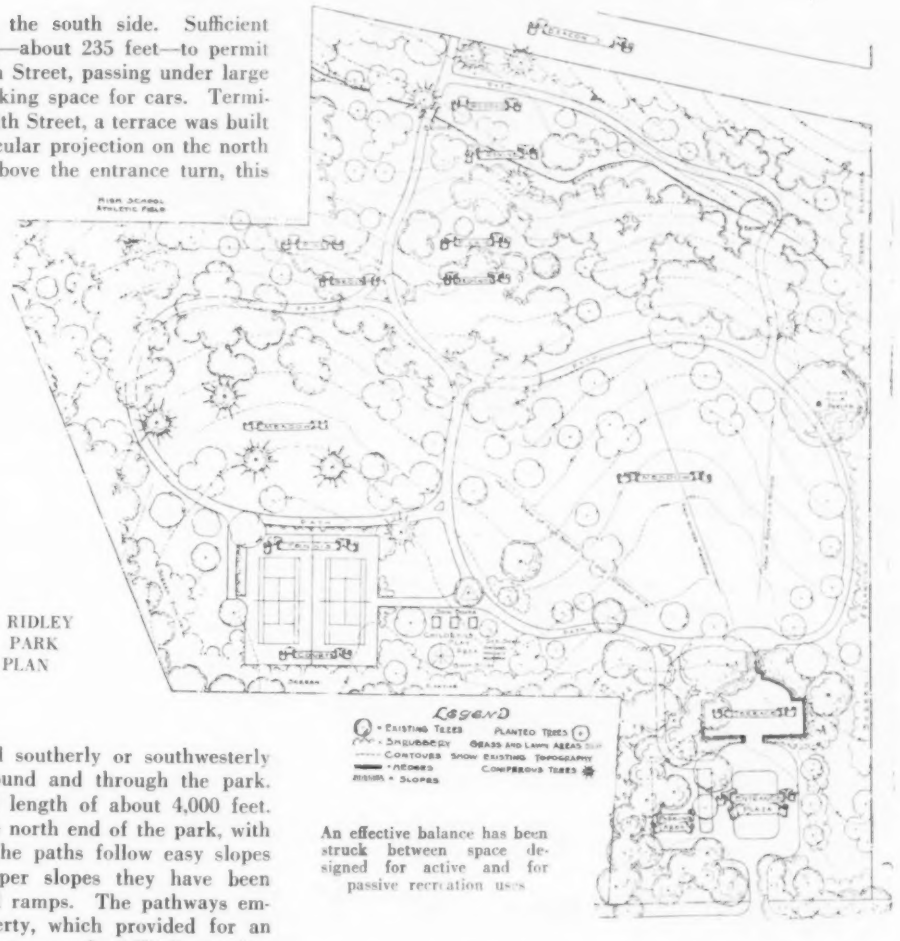
The design was worked out to provide a restful park of scenic beauty that would appeal to the older people in this neighborhood. The path system was arranged to be used by children passing through to the high school, and the wooded ravine was designed for picnic purposes. Having made provision for the older people, it seemed advisable to include recreational features to make it of interest to the children of the neighborhood. As the high school ground did not include tennis courts, two courts were built in the southwest corner of the property where comparatively little grading was required. Adjacent to these tennis courts a small children's playground, with suitable apparatus, was planned.

Withal, the design of the park was worked out primarily to preserve the natural features of this tract for all time; and within the limits of the topography and environment to make the area of most interest to children as well as adults.

VIEWS OF THE NEW DEVELOPMENT

Above are shown the southwest corner of the tennis courts under construction, with the walkways being surfaced and graded; and the same section with the tennis courts in use and the lawn grass well established. Below are the completed entrance plaza and the terrace beyond; and a woodland ravine within the park, with rustic bridge and walkway

The logical entrance was on the south side. Sufficient frontage existed on Smith Street—about 235 feet—to permit of entering on the axis of Church Street, passing under large oaks, to a natural plaza with parking space for cars. Terminating this axis 160 feet from Smith Street, a terrace was built 35 feet by 90 feet, with a semicircular projection on the north side, and elevated several feet above the entrance turn, this being the highest point and a natural location to overlook the park. The construction of the terrace required considerable filling, secured by cut from the meadow and other sections. The resulting slope on the north and east sides varied from 4 to 20 feet, with 2 to 1 slopes, planted with Caryopteris incana (blue spiraea). The terrace was hedged with Abelia at the top, with walkways of stepping stone. At some future date a rest house or overlook will be built on the terrace. This could not be done satisfactorily at the time of development of the park, on account of allowing for the fill to settle, and also because of lack of finances.



RIDLEY PARK PLAN

An effective balance has been struck between space designed for active and for passive recreation uses

From the terrace in a general southerly or southwesterly direction the walkways lead around and through the park. The pathway system has a total length of about 4,000 feet. It crosses the small stream at the north end of the park, with two attractive rustic bridges. The paths follow easy slopes wherever possible, and on steeper slopes they have been ramped with typical log and soil ramps. The pathways emphasize the design of the property, which provided for an open park meadow north of the terrace and a hillside meadow north of the tennis courts. Where the pathways traverse open sunny areas, shade trees have been planted to shield all walkways from the heat of the midday summer sun.

Balanced Development

Other than use of the wooded ravine for picnic purposes, recreational features were concentrated in the southwest corner, as shown on the plan. The tennis courts were built economically; little grading was required, and location on the crest of the hill made subdrainage for these public courts unnecessary. Of course, on these and many other features more could have been spent, but the total allowance was properly proportioned for each item.

Heavy grading was concentrated in a few areas. Considerable cut at the entrance and in the entrance plaza contributed to the fill of the terrace and supporting slopes. Several feet of cutting gave smoother slopes in the meadow, and the dirt was also used to advantage on the fill of the terrace. A balance of cut and fill was obtained on the tennis courts. Ravines and slopes required smoothing and filling. Pathways where located on side hills were so graded as to balance in cut and fill. A quantity of stone was blasted from the meadow. The drainage was a considerable item, owing to steep slopes and the necessity for carrying storm water from the entrance plaza to the north ravine. Topsoil and sand-clay pathways were drained at frequent intervals to prevent the washing of the natural gutters along the sides.

The usual method for getting a stand of grass in this section is to "sprig" or plant Bermuda roots in the spring. In some sections there was considerable turf, which was topdressed and fertilized. In other sections, and particularly the meadow, where considerable grading was done, it was necessary to harrow, topsoil, fertilize, and sprig Bermuda. In the wooded ravine, where no grass would make all-year growth, pine needles formed a satisfactory soil cover.

Suitable planting was done. Open areas were planted with deciduous trees for summer shade. Objectionable views of rear yards on the east boundary and part of the south boundary, west of the entrance, necessitated a heavy screen planting along these boundaries. On the Bacon Street boundary, north of the ravine, planting was introduced to conceal the unpaved street and to form a boundary of foliage. Trees and shrubs were planted against the pine woods to lend interest to the view from the terrace. About 2,500 trees and shrubs were planted.

Around the two tennis courts steel poles and galvanized wire backstops were used, with steel nets and net posts installed as permanent court equipment.

Expenditures

Construction was started after landscape plans were completed, in the fall of 1930. Owing to continuous rains, work was stopped the middle of December. It was resumed the latter part of February, 1931, and completed by April 1. The original appropriation of $9,000 was to cover every expense and to be used to best advantage. Of the total appropriation, $3,805 was spent for labor—a direct contribution to unemployment relief. The average labor gang included from five to ten two-mule teams and driver, with twelve to fifteen additional men, directed by one labor foreman. The rates paid were 60 cents an hour for teams and drivers, 50 cents an hour for foreman, and 15 cents an hour for common laborers. Services of plumbers and other artisans for special work were contracted on a lump-sum basis.

The average weekly labor payroll ran from $250 to $400. Topsoil cost $1 per cubic yard delivered; brick $10 per thousand. In the drainage system, No. 2 pipe was used; 8-inch V.S.P. laid at 17 cents a linear foot; 10-inch at 23.8 cents; 12-inch at 30.6 cents. The water lines included 1,450 feet, varying from ¾-inch to 1½-inch G.I. pipe, with ten spigots, the water being piped to different portions of the park.

The values received in plants and planting would seem unusual to northern purchasers. Several nurseries made especially low prices on this relief project; 915 broad-leaved evergreens were used. To give an idea of some of the costs: Ligustrum japonicum (Japanese privet) B & B 4-foot to 5-foot size, delivered for 50 cents; Laurocerasus caroliniana (Carolina cherry laurel) 2-foot to 3-foot size, B & B, 40 cents; Pyracantha lalandi (Laland firethorn) 3-foot to 4-foot size, B & B, $1.25. We were fortunate in being able to get a few nursery-grown evergreen trees, Quercus virginiana (live oak) 8-foot to 10-foot, heavy, delivered for $1. Abelia grandiflora, 2-foot, to 3-foot size, were supplied for the hedge on the upper portion of the terrace for 25 cents. Nine hundred and ten deciduous flowering shrubs were used: Spiraea thunbergi, 3-foot, at 25 cents; with the same price for such other plants as Weigela, Philadelphus, Deutzia, Buddleia, etc. A number of broad-leaved evergreens and shrubs were also used for accent and color, such as Nandiana domestica, 2-foot to 3-foot at $1; Cornus florida (white dogwood) 3-foot to 4-foot, bushy, at 35 cents; Hibiscus syriacus (Althea) in variety 3-foot to 4-foot at 25 cents; and Cercis canadensis (redbud) 3-foot to 4-foot, 35 cents. About 200 trees were used. For shade trees, mostly hackberries, American sycamore, Norway and red maples, and willows. The Southern magnolia grandiflora, and Acacia nemu (Mimosa) were also used. The price of trees delivered on the ground, sizes up to 12-foot to 14-foot height, varied from 35 cents to $1.50. The rest of the planting was for banks, screens, etc.

The original allowance for this construction work, as stated, was $9,000. The costs on different items of work are shown in the following schedule; the total cost of all plans, labor, material, and supervision to complete the job was under the appropriation:

1.	*Clearing and grubbing*		$285.75
2.	*Meadow and general areas*— Including all dirt used, fertilizing, finishing, and sprigging grass areas		672.53
3.	*Entrance and terrace*— Grading, finishing, one flight of stone steps, fertilizing and seeding		1,489.65
4.	*Paths—grading and surfacing*		384.00
5.	*Plants and planting*— Including manure and fertilizers		934.08
6.	*Bridges* (2)— Including timber, construction and creosoting		71.24
7.	*Drainage*— All pipe, inlets, castings and labor		422.78
8.	*Water lines* All materials and labor		238.07
9.	*Tennis courts* (2)	$674.22	
	Enclosure and nets	710.00	1,384.22
10.	*Miscellaneous items* (not included above)		247.79
11.	*Engineer-superintendent* on job—travel and local expense		1,718.11
12.	*Plans, supervision and expense*		1,010.15
			$8,858.37

Qualifications—Not Bids—Will Insure Proper Engineering Service

An Interesting Example of What Happened When Certain Municipal Officials Sought Bids from Engineers

LAST June a certain township asked for propositions from engineers for the preparation of an assessment or tax map for the township to meet the requirements of the State Board of Taxes and Assessments. The notice asked for five definite statements: (1) qualifications of the engineer; (2) experience and financial ability; (3) fees to be charged; (4) method of preparation; and (5) length of time required for the work.

The information given to the engineers who were requested to present bids was quite specific. The law of the requirement of the State Department of Taxes and Assessments is clear and the specifications are easily understandable. Despite this information, many of the sixteen engineers who submitted proposals were far from meeting the requirements. The bids ranged from $1,500 to $28,412 with one bid of $300 per month, although a total figure was requested; and another bid of $450 per square mile, contrary to the specifications. This wide variation naturally left the township committee in an unenviable position. They had been advised at the start, however, that the best results could not be obtained by endeavoring to select an engineer on a competitive basis, that is, competitive as to fees, and that they should select him on a basis of qualifications.

The only conclusion that can be drawn from the wide variety of proposals offered is that a large number of this group did not know their business and by bidding on a cut-rate basis undermined the confidence of the township committee and the general public in engineers and the engineering profession. The men in whom the town officials should have explicit confidence and upon whom they should be able to depend for professional advice and guidance in the expenditure of large sums of money for public improvements, have in this, as in many other cases, fallen down regrettably. These engineers who would make specifications, estimate quantities and ask for competitive bids from contractors to do a certain piece of work and expect the bids from contractors to be within a reasonable limit, have in this incident put themselves in a position to justify ridicule rather than praise. The township committee should reject all these proposals and select the engineer who in their opinion is best qualified to do the work. This move would be in the best interests of the taxpayer.

The Present Water Works of Baltimore and the Additions Proposed

By CHARLES F. GOOB
Chief Engineer,
Department of Public Works,
Baltimore, Md.

THE Bureau of Water Supply is one of the important divisions of the Department of Public Works of Baltimore. It is the successor of the former Baltimore Water Co., a private corporation, which the municipality purchased in August, 1854, at a cost of $1,350,000. This private water company was incorporated in 1804, after the town itself had failed to obtain the necessary capital to develop a water supply. The company, as the result of its poor service, had varying vicissitudes until it was sold.

Since the acquisition of the private company by the city, the water engineers heading the Bureau of Water Supply have been men of conspicuous engineering attainment, and by their efforts the Bureau has been thoroughly modernized; at all times keeping the supply ahead of the average consumption.

Source of Water Supply

Water is supplied the city from the Gunpowder River, where there is an impounding dam located at a point called Loch Raven. The crest of this dam is at 240 feet above mean tide, and the foundation 130 feet lower. Back of this dam 23,000,000,000 gallons of water is impounded, and a safe yield of 144,000,000 gallons a day is assured from this source.

From the impounding dam the water passes through a 12-foot tunnel 7 miles long to the Montebello filtration plant. The tunnel is from 65 to 300 feet below the surface, and driven through rock, with the exception of about 2 miles which is lined with brick.

At Montebello are located two filtration plants—one with a safe capacity of 128 million gallons per day, and the other, a newer one, with a safe capacity of 112 million gallons per day—having a total capacity of 240 million gallons per day. The water is pumped from the end of the 12-foot tunnel at Montebello into these filtration plants, from which the filtered water, after being sterilized, flows into the adjoining clear-water basins. The basins are at 217 feet above mean tide, and supply by gravity the low-service zone of distribution, which is that area between contours 0 and 100, and comprises at the present time about 50 per cent of the total territory supplied and consumes about 60 per cent of the water filtered.

The Middle and High-Service Zones

From the low-service zone of distribution, water is pumped by the Vernon and the Hillen pumping stations to reservoirs at elevation 350 feet above mean tide, which comprises the middle zone of distribution, located between contours 100 and 250. This zone covers 30 per cent of the territory supplied and consumes about 30 per cent of the water filtered.

From the reservoirs of the middle zone, water is pumped into reservoirs at elevations 516 feet and 565 feet, comprising the high zone of distribution, on the northeastern and northwestern sides of the city, respectively. These combined zones cover about 15 per cent of the total territory supplied and consume about 9 per cent of the water filtered.

Adjoining these reservoirs the Bureau has pumping stations which supply water to standpipes at elevations 666 feet and 700 feet. These zones of service are small; they comprise about 5 per cent of the territory supplied and use about 1 per cent of the water filtered.

Distribution System

The Bureau has 1,426.3 miles of water main, 9,881 fire hydrants, and 20,872 valves in the distribution system. There are 195,321 water-supply services, ranging in size from ¾-inch to 12-inch, of which 50,000 are metered. As of January 1, 1931, the reproduction cost new, less accrued depreciation, was $66,350,811, against which there were outstanding bonds to the value of $32,970,500.

New Construction Under Way

The new filtration plant at Montebello, 112 million gallons a day capacity, is of the very latest design and comprises new ideas in filtration well worth inspection. In Druid Hill Park, alongside Druid Lake, the Vernon pumping station, electrically operated, has just been completed. This station supersedes the Mt. Royal pumping station, which was steam-operated. The pumping units of 30, 40 and 50 million gallons capacity, operating against an average net head of 60 pounds, were first operated last month. The Vernon pumping station, in my opinion, is the most modern station in electrical equipment, in design and in architectural treatment. The Hillen pumping station, with two 20-million and one 30-million gallons per day units, is well worth inspection by those interested in pump design and operation.

The Guilford pumping station, placed in operation recently, is arranged to work automatically. There are two 10-million and two 15-million gallons per day units. This station is interesting, as it is constructed in an exclusive suburban residential section, where noise would be objectionable. By its architecture and its electrical design it fulfills these conditions perfectly. Several small automatic pumping stations are operated by the variations in water pressure, and only visited at regular intervals for inspections.

A 4-million-gallon steel tank has been erected at Curtis Bay. This structure is 110 feet in diameter and 65 feet high, and will be enclosed by a masonry wall of a pleasing design.

The Bureau has under construction the Prettyboy dam on the upper Gunpowder River. This is an impounding reservoir of 20 billion gallons capacity, and will increase the safe yield of the Gunpowder from 144 to 186 million gallons a day. The structure will be 140 feet from the

foundation to the crest, with a roadway bridge crossing over the crest, and is expected to be completed in July, 1932.

Also of much interest is the 14,000-foot tunnel the Bureau is constructing from the New Montebello filtration plant to Druid Lake. This conduit will be 84-inch inside diameter and will be constructed of concrete cylinder pipe inside calked. The depth of the structure ranges from 60 to 100 feet. It is expected that this tunnel will also be completed in July, 1932.

Because of the severe drought of 1929, the water at the present Loch Raven dam has been below the crest since July, 1930, reaching a maximum, on December 26, of 14.6 feet. Since that date the water level has risen to 5.5 feet below the crest as of May 1, 1931.

This depletion of the impounding capacity, and the fact that it has taken twelve years from the date of the authorization of the bond issues to complete the Prettyboy dam, has created apprehension that the city may again face a water shortage before an additional supply can be introduced. For this reason the municipality has authorized a bond issue for the installation of water mains and to study the water resources around the city to determine whether an additional supply should be brought in from the water sources northeast of the city or from those northwest of the city.

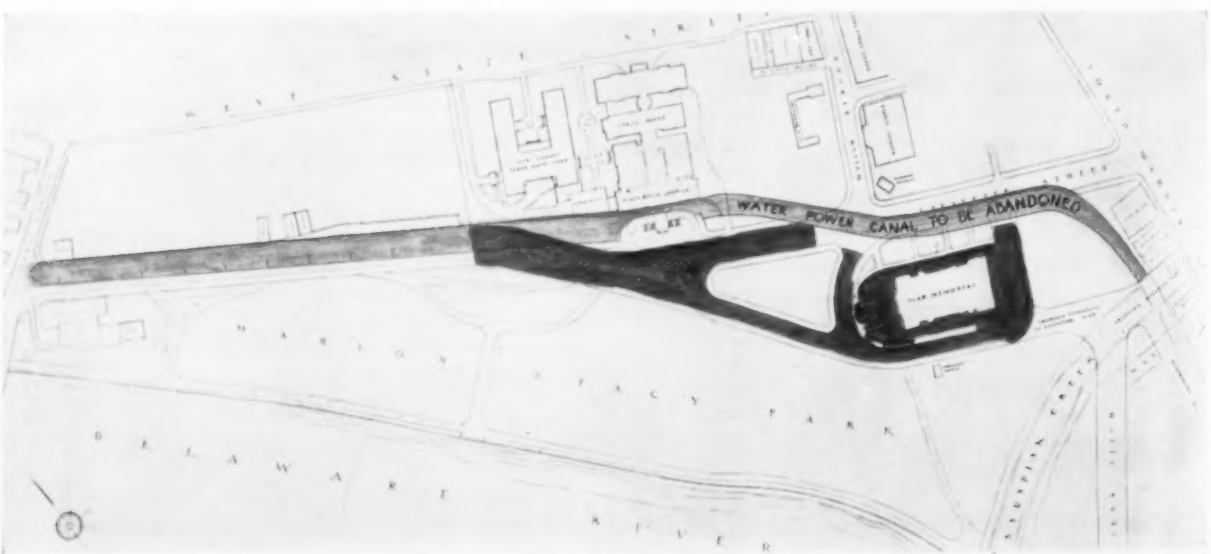
New Boulevard and Memorial Drive for Trenton

LOOKING TOWARD THE WAR MEMORIAL

EFFECTIVE joint action by city, county and state have achieved for Trenton, N. J., an imposing stretch of boulevard and a Memorial Drive, one unit of which is now nearing completion. These will complete a magnificent civic center development around the State House (for which extensive alternations are to provide a new front so that it will face the park and the river), will link this development with the Mercer County War Memorial Building, and create an important new traffic artery.

This achievement is the climax of improvements extending over a number of years—improvements which have transformed the dump heap and mud flats formerly lying between the State House and the Delaware River into a beautiful area now known as Stacy Park. The Memorial has until now remained isolated by Sanhican Creek, and the State House has fronted upon a busy street. The whole far-reaching scheme is being carried through according to the brilliant plan made by City Commissioner Abram Swan, Jr., at the request of Governor Morgan F. Larson. As shown in the plan, the improvement will provide a driveway completely encircling the Memorial Building and the landscaped area around it. The broad new east-and-west boulevard will go far towards solving the present and future traffic needs of the city and will provide a link in the thoroughfare system of the region.

Meantime Stacy Park will not be spoiled by the construction of the traffic ways, but will rather have its beauty enhanced by reason of the minimum amount of traffic which will now pass through it.



THE PLAN OF THE IMPROVEMENTS

The state capitol group is shown above. The darker area shows work nearing completion at a cost of $194,000; the lighter area shows the boulevards; the whole is to cost $400,000, of which the state is to pay $250,000. This section, already one of unusual charm and historic interest, will be rendered much more attractive by the undertakings

A New Refuse Disposal Plant in Manchester, England

ON November 6, 1931, a new refuse disposal plant was placed in operation at Mount Road, Gorton, Manchester, England. Outstanding in this plant is the method of separating the refuse mechanically. The advantage of this is the abolition of night work, for the whole work is carried out during the daytime in one 8-hour shift, instead of the three 8-hour shifts necessitated by the destructor method of refuse disposal. Working conditions are improved, because the plant is almost wholly covered and the process practically dustless. With the exception of one small section, namely, the work at the sorting table, the treatment of the refuse from beginning to end is mechanical and hidden from view. Salable materials contained in the refuse may be easily and efficiently salvaged. A considerable net economy of work is revealed as compared with other inside depot methods of disposal.

Description of the Plant

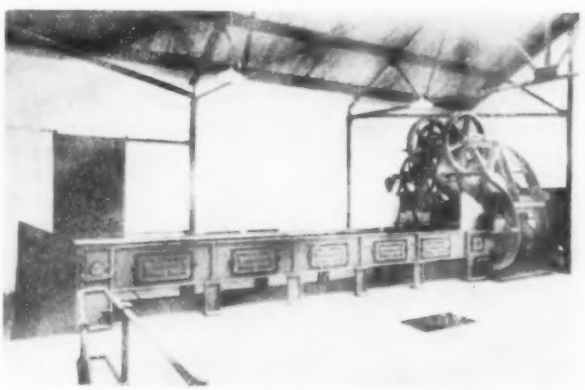
The separation plant at the Mount Road depot is built on the Petrie & McNaught principle and provides for a primary separation of the refuse before passing to the rotary screen. In addition, this particular plant supplies the power required for raising steam for the central heating of houses on the Housing Committee's Gorton Mount Estate.

From a reinforced concrete hopper having a capacity of of about 35 tons, into which the crude refuse is dumped from the collecting vehicles, the refuse is drawn by a conveyor to a point where it is elevated to the screening house, the refuse being leveled at two points to insure an even rate of devilery. In the screening house the crude refuse is first shaken by a reciprocating shaker of heavy spring steel prongs, the bulkier materials being delivered to the screening table, and the smaller material falling down a steel chute onto the belt of a magnetic separator. The bulky material, having been freed from dust, cinder and other small matter and from non-combustible material which can be salvaged, is fed direct to the incinerator without further handling. The incinerator is provided with forced-draught apparatus, the gases from the fires, after passing through a combustion chamber, being used for raising steam.

The magnetic separator extracts all small metal and passes the rest of the material into a rotary screen, the first section of which screens fine dust, the second section fine cinder, and the third section larger cinder. Small garbage is removed from the larger cinder by an extractor belt and, with the small cinder from the second section, is conveyed to the boiler fronts, where it is used for hand-firing. The large cinder, after cleaning, is a valuable fuel, suitable for storage.

Tin cans which are hand picked from the screening table are machine-pressed into handy, compact bales for sale, and bottles, broken glass, etc., are delivered to a storage bunker for a similar purpose. Other incombustible matter is also delivered to a separate storage bunker. The plant as a whole is capable of dealing with 120 tons of crude refuse per day of 8 hours.

MOUNT ROAD WORKS, SHOWING RECEIVING HOPPER AND SCREENING HOUSE



THE PRIMARY SEPARATION TABLE WHERE THE LARGE AND THE SMALL MATERIALS ARE SEPARATED

Apart from the space occupied by buildings considerable ground space was provided in the past for wagons to stand upon during off-duty periods and for dumping refuse until such time as it could be handled by the old-style plants. With the advent of mechanical traction and more compact and faster-working disposal plants, much of the yard space at this and other depots has become available for other purposes. By the judicious use of grass plots, trees and shrubs, these depots are being transformed from uninteresting town yards into places almost of beauty, according to an article in *The Municipal Review*, London.

A CITY PLANNING FILM

"THE City of Tomorrow," a film produced in Germany to popularize city planning ideas among public officials, civic organizations, clubs and schools, has been made available in the United States through the generosity of Ferdinand Thun, of Reading, Pa.

The captions are in German, but the film is readily intelligible, especially if preceded by an explanatory talk. Address National Conference on City Planning, 130 East 22d Street, New York.

Crime Clinic Established in New York City

THE shortcomings of our present system of punishment for crime are becoming more widely realized, and improvement is being attempted in various places and by various methods. The psychiatric study of the individual criminal is frequently and authoritatively recommended, as a means of giving intelligent guidance in the matter of sentencing and to any special efforts looking toward reformation of the offender, and also furnishing information as to the personal causes of crime.

New York has recently assumed an advanced position in this pioneering effort, by the opening on December 24, 1931, of a psychiatric clinic in the Criminal Courts Building. This is under the direction of Dr. Menas S. Gregory, of the psychiatric division of the Department of Hospitals. *Municipal Reference Library Notes* (New York) describes the work of the clinic as follows:

"In the Criminal Courts Clinic it is planned to give every convicted person a thorough psychiatric examination, even though he is believed to be entirely normal. Thus the judge, before he sentences a prisoner, will have complete and advance information on the mental and moral status of the convicted person. He has thereby a scientific basis for imposing sentence. If it appears that a prison sentence is advisable, he determines which prison. If the prisoner should be sent to a hospital or some special institution, he decides where it is best to send him. If the convicted one is a first offender and has previously had a good reputation, the judge may decide to release him on probation. With the complete and expert opinions which the Clinic and the Probation Divisions can furnish him, the judge is able to determine quickly and wisely the nature of the sentence that should be given. Since the Clinic is under the Department of Hospitals, the judge has the added advantage of being able to send those that require medical or psychiatric treatment to the proper institution at once. The prisoner whose mental and moral status puts him past help and who would remain a menace to society no matter how he was treated, can be dealt with to the full extent of the law and be kept where he cannot harm society. The punishment is made, not to suit the crime, but rather the person who has committed it.

"Records of all the prisoners examined will be kept and so arranged that they may be studied by experts. Thus information will be collected which can be helpful not only to those who administer the laws, but also will be of assistance to those who are preparing new legislation or who seek to revise those statutes now found on our law books. The new Clinic's chief function, however, is to provide the courts with exact data for determining the individual cases before them."

The idea of psychiatric clinics in connection with criminal courts is believed to have originated with Cesare Lombroso (1936-1909), the eminent Italian criminologist. The first clinic of this kind in the United States was established in 1909 by a private foundation in Chicago. In 1914 the Municipal Court of Chicago took it over; later it spread to the whole state of Illinois and is administered under the State Department of Public Welfare. By 1918 clinics of this nature were also in operation in Boston, Buffalo, Cincinnati, Detroit, Los Angeles, Memphis, Newark, New York, Philadelphia, Pittsburgh, San Francisco and Seattle.

The new clinic just established in New York, according to information received from the Municipal Reference Library, has a fuller, more complete program than any court clinic so far established by any other city. The Detroit Psychopathic Clinic presents perhaps the nearest approach to it. Some of the pronounced features of the New York Psychiatric Clinic are these: it is supervised and carried on by the Department of Hospitals, which possesss a large and eminent staff of psychiatric specialists; it permits the judge to assign at once any prisoner to the proper institution for further examination or treatment; it will examine every prisoner brought into the criminal court; it will keep detailed records of clinical and physical facts for each offender; it will thus enable the judge to determine intelligently the type of institution or the kind of sentence best suited for each case.

Reducing Election Costs

A RECENT study of the cost of elections in New York State cities shows that the average cost per vote is 76 cents. In order to effect substantial reductions in this cost, many important changes and additions to the election laws were found to be necessary. A commmittee representing the New York State Conference of Mayors and the State Association of Election Officials made a study of the election laws. This committee consisted of Alexander S. Carlson, Syracuse; John A. Bishop, Geneva; C. C. Thompson, Cortland; Charles J. F. Decker, White Plains; A. A. Nichols, Rochester; James Matthews, Ithaca; George Zechiel, White Plains, and Frank V. Hogan, Albany.

They recommended twenty-two changes in the present election laws. Among the changes are: permanent registration of voters; universal use of voting machines; placing of election inspectors under civil service; advancing pre-primary dates at least one week; appointment of election inspectors by commissioners of election instead of by mayors; advancing registration dates one week; special enrolments for new parties; giving election commissioners power to change districts as necessary when local legislative bodies do not act; standardizing salaries of election officials; use of schools for election purposes; reducing requirements of election advertising; delivery of returns by city clerks to county-seats; and reduction in the number of registration books from four to two.

In some places the universal use of voting machines is mandatory, in others optional. As a result of this discrimination, many citizens look upon the matter as political, with one party forcing their use in specified districts in order to embarrass the opposition. Machines lessen time and effort, on the part of both officials and voters. Returns are promptly obtained, instead of being delayed for hours, or even for a day or two, as occasionally happens when paper ballots are used. These considerations alone should make their use in every district mandatory.

Another recommendation of importance is placing election inspectors on a civil service basis. While this would not end all troubles connected therewith, it should raise the standard, which is some places is too low. Of much value is the suggestion for permanent registration. Adoption of this method might help to encourage many non-voters to exercise their rights. But the greatest difficulty would be in purging the lists of those not eligible because they have moved or for some other reason. If that change were effected, some means of checking voters better than that in use where non-personal registration now prevails must be devised.

E. D. GREENMAN.

How City Planning and Civic Spirit Have Kept Springfield at Work

By JOSEPH TALMAGE WOODRUFF

ACQUISITION AND DEVELOPMENT

A new park area is shown above. Below is an area from which 6,000 yards of peat moss and 4,000 yards of highway filling have been taken

SPRINGFIELD, MASS., has almost no unemployment. Mayor Dwight Winter has taken advantage of the abundance of both skilled and unskilled labor and the cooperative spirit of the property owners and officials to carry on permanent improvements according to well-tested plans made over the last ten years.

One of the most interesting of the many projects he has undertaken centers around the story of O'Shea Hotel.

A year ago, Robert P. Marsh, Superintendent of Streets and Engineering, was successful in purchasing for the city, for $4,600, a piece of swamp land for a dump in the outlying portion. This area has since become a beehive of activity, with recreation hall, dining hall, modern kitchens and lavatories, dispensary, barber shop and administration offices, in fact, a self-supporting business, carrying on constructive work according to a City Plan. Even the well-constructed buildings were salvaged from portable schools. Everything was designed for "peacetime use" when this economic war is over. Eating benches are so constructed that they can be turned into park equipment. The permanent buildings will become locker rooms for a future playground when the present work is done.

From this $4,600 property the city has taken already more than 6,000 yards of peat moss for a new golf course, more than 4,000 yards of filling for a highway project, more than 8,000 tons of sand, normally purchased for street sanding in icy weather, and more than 150 cords of wood. Most of the salt pork used in the kitchen comes from the "farm" that is worked by a crew in the summer. Beans, tomatoes and pickles are home products, and canned goods and foodstuffs are purchased from local dealers at most favorable prices. A storeroom with shelves lined with gleaming jars of preserves is testimony to the efficiency of the "plant." Barrels of sauerkraut of home manufacture stand waiting to be utilized.

O'Shea Hotel is the operating center. In this well-equipped building more than 37,000 men were given hot dinners in the 25 weeks up to June 19, 1931, at an average cost of 8 cents per man. The chef and the baker, the electrician and the plumber, the carpenter and the mason, have been picked from the classified list in the administration office. Food is paid for by the employees of the Department of Streets and Engineering, who contribute a small sum from their weekly pay envelope. O'Shea Hotel has its own bank checks and operates as a corporation, just as any other business. Since it is managed by the men who contribute from their pay for the food, there is no danger that those who are fed will fail to put in a good day's work for the city. Furthermore, the supervisors are men well trained in construction, and each worker is picked for his fitness for the job assigned. There

O'SHEA HOTEL

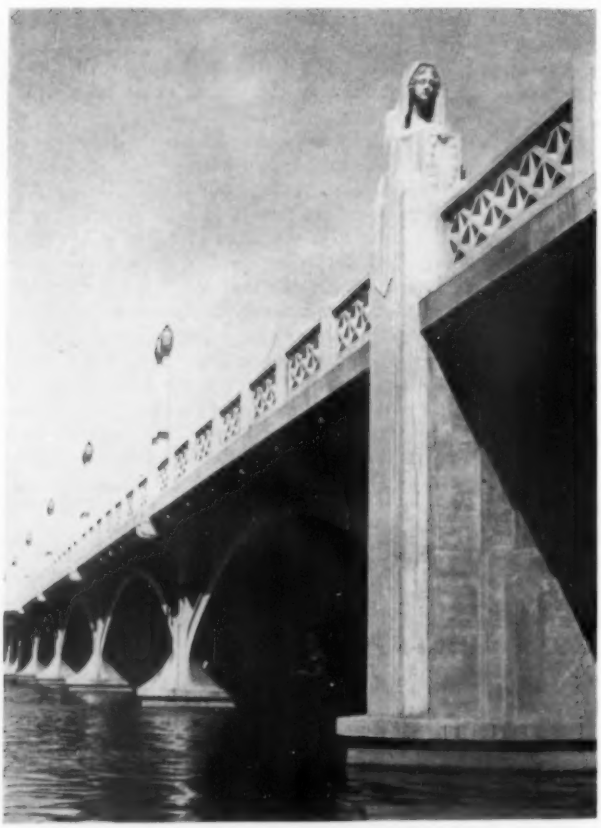
The exterior is reminiscent of a Rocky Mountain camp. The interior is spotless. The kitchen (below) is scientifically equipped with used, donated apparatus

is no loafing. Each man is actually doing something constructure for his city and they all take satisfaction in that realization.

Every day truck loads of men from the central part of the city are taken out to work. They are assigned specific jobs according to schedule. Just now some go to a nearby park project, the more than 200 acres of which has been given to the city for development in accordance with proposals in the City Plan. Others go to a parkway that is being built across the city, the land for which has been given. Still others are busy on a main traffic artery that is being widened to 80 feet for a distance of 3 miles through use of a 30½-foot strip donated by property owners. There is evidence everywhere of the finest kind of cooperation between public officials and private citizens. The City Plan has so permeated the lives of the people that they generously contribute needed lands for the parks and public improvements. Springfield has many times set an example in civic pride, cooperation and efficiency in management. In economic war as in prosperous peace she carries on according to her Plan.

New Beauty in Bridge Design

Cast Concrete Produces Sculpture Effect at Low Cost



THE NEW 9-ARCH CONCRETE MEMORIAL BRIDGE ACROSS THE FOX RIVER AT AURORA

Showing the pylon figures, lighting standards and hand rails, all designed by a sculptor and cast in concrete

AURORA, ILL., where famous private art collections have overflowed into hotel and club lobbies and into public buildings, recently completed a monolithic bridge across the Fox River—a bridge remarkable in its beauty and unique in its design in that all the decorative features were created by a sculptor.

Usually, bridges are designed by engineers, with perhaps some architectural aid, but the Aurora Memorial Bridge is possesed of original hand rails, lamp-posts, light fixtures, and pylon figures—all from the hand of a prominent sculptor, Emory P. Seidel, of Chicago. In addition, Mr. Seidel made a heroic statue, "Memory," the figure of a woman which forms a fitting decorative piece in that it was designed not as a single unit but as a harmonious part of the bridge.

Through this employment of a sculptor to bring true beauty into what otherwise might have been just another bridge, Aurora has taken a step forward in bridge creation which will help bring realization that bridges need not be as drab as gas tanks, telephone poles and other things that must be put up with along public thoroughfares.

Walter E. Deuchler, City Engineer of Aurora, who is credited with the conception of the bridge, concluded that no one was better fitted to add the decorative and memorial features to the concrete bridge than a sculptor, whose life work it is to create beauty in stone.

The Pylon Figures

This was Mr. Seidel's first serious effort in working with concrete, but the results were so satisfactory that he recently declared that the ease with which concrete could be molded into decorative designs opened up an almost untouched field in bridge construction. What may be done with concrete is symbolized in the pylon figures of the Aurora bridge. Two of these figures are at each end of the bridge on opposite sides. The design is that of a woman holding a soldier's helmet and a wreath in her lap. At night, lamps concealed in the helmets light the faces of the figures. These rise about ten feet above the bridge floor and are cast in one piece along with the pylon, giving the end piers both a substantial and a beautiful appearance.

These four similar pylon figures were cast in place on the bridge. The plaster molds were placed on top of the pylons and then filled with concrete. Neat concrete made with sand and containing a larger proportion of cement was first placed in the mold. Then heavy concrete containing larger aggregate was dumped on top and forced downward so that all crevices of the mold were completely filled. It was necessary to cast the plaster molds from two clay figures to obtain a proper facing of the hands. Each mold was used for two figures.

Mr. Deuchler has determined from his figures on the Aurora bridge that satisfactory decorative features may be given to bridges by adding only 4 or 5 per cent to the cost of the structure. In the Aurora bridge the decorative cost was about 10 per cent, but much of that was consumed by the central bronze figure, "Memory."

Water Softening at Western Springs, Illinois

By **L. R. HOWSON**
Alvord, Burdick & Howson,
Consulting Engineers, Chicago

WESTERN SPRINGS is a suburban community located some 15 miles west of Chicago. The 1930 census showed a population of 3,894, an increase of 210 per cent in the last decade. From the time when the first municipal water works was constructed at Western Springs, the community has been handicapped by an exceedingly hard water supply. The use of the public water supply for household purposes that require soap has been practically impossible. This has resulted in the almost universal construction of cisterns or the installation of household zeolite softeners, either of which requires duplicate plumbing.

In 1927, the village of Hinsdale, adjoining Western Springs to the west, built a softening plant, and observation of that plant's successful operation, combined with a growing dissatisfaction with the local supply, led the Western Springs village officials to have an investigation made of the practicability and costs of a municipal water-softening plant for Western Springs.

The Quality of the Water

The public water supply of Western Springs has a total hardness of approximately 900 parts per million, or 53 grains per gallon, about 60 per cent of which is permanent hardness. In addition, it carries an iron content of approximately 3½ parts per million, which has resulted in discoloration of plumbing fixtures and staining of laundry and cooking utensils. The following table gives the results of two analyses of the water:

	Analyses by Illinois Department of Health February 2, 1927	Analyses by Charles P. Hoover June, 1930
Alkalinity	398	356
Non-carbonate hardness	531	540
Total hardness	929	896
Calcium	228	232
Magnesium	87	77
Iron as Fe	3.5	3.4
Anhydrous sulfuric acid	544	516
Chlorides as Cl	11	21
Free CO_2	-	82

In view of the rapid growth of all the suburban communities adjacent to Chicago, in which Western Springs has shared, it was thought desirable to build a plant having a rated capacity of 1,500,000 gallons per day, which should provide for the requirements of the next decade. At the present time, the plant will operate for approximately half the time.

Types of Treatment Studied

In studying the design of the treatment works, comparative estimates were made of two types of treatment, namely, lime soda-ash and lime zeolite, and four types of plant, as follows:

A. Lime soda-ash plant, single-unit mixing chamber, settling basin and carbonating basin.

B. Lime soda-ash plant, duplicate unit construction.

C. A lime soda-ash plant utilizing steel settling tanks of the railroad type, followed by pressure filters.

D. A combined lime-zeolite process in which the carbonates and iron would be removed by lime in a plant similar to that outlined above under "A," followed by passage through a zeolite filter for the removal of sulphate hardness.

All projects were compared on the basis of reducing the water from approximately 900 parts per million to approximately 120 parts per million.

The following table shows the summarized estimates of the cost of construction and the annual cost of operation under the various projects. The project described above as "A" was that recommended and adopted for construction.

	Plan "A" Lime Soda 1 Unit	Plan "B" Lime Soda 2 Units	Plan "C" Lime Soda Railroad Type	Plan "D" Lime Zeolite
Investment	$80,520	$100,210	$67,100	$111,320
Annual cost—interest and depreciation at	8% 6,450	8% 8,000	8½% 5,620	8½% 9,450
Operating expenses based on year 1929	14,640	14,140	14,640	12,900
Total annual cost	$21,090	$22,140	$20,260	$22,350

The New Plant

The plant, the construction of which is now nearing completion, consists of aeration for the removal of CO_2, which is present in the water in the amount of approximately 80 parts per million, followed successively by a quick mix with the lime and soda accompanied by violent agitation, slow mechanical mixing and stirring, subsidence in a mechanically cleaned coagulating basin, recarbonation, and filtration through sand before passing to the clear well. Several parts of the plant may be by-passed if necessary for repairs or other reasons. In the feeding of the chemical and formation of the floc, every effort is made to secure an intimate mingling of the chemicals with the water as quickly as possible and, that having been secured, to progressively reduce the agitation so as to produce the largest floc and thus facilitate rapid settling.

The aerators as designed are the adjustable orifice nozzle type, eight nozzles being provided, each having a rated capacity of 250,000 gallons per day. The aerators are located vertically above a part of the carbonating basin, the roof of which forms the collecting basin for the water as it falls from the nozzles. Aeration is for the removal of CO_2, thus lowering the lime requirements.

After aeration, the water flows to the quick mixing basin, which is approximately 7 feet 6 inches square with a 12-foot depth, providing a retention period of five minutes. The lime and soda-ash are added in this basin, and the mixture is violently agitated by an electric-driven mechanical mixer of the propeller type.

The chemical feeding equipment consists of duplicate dry feed machines, each with slaker and scales and necessary accessories. Each machine is adapted to the feeding of approximately 30 grains per gallon each of lime and soda-ash, and adjustable for rates of plant operation varying from 400,000 gallons per day to 2,250,000 gallons per day, requiring 70 to 400 pounds of chemical per hour. The dry feed machines are operated by electric motor. Although the filtered water will be sterile from the excess lime treatment, a chlorine installation is included as a factor of safety.

From the quick mix, the water, with its dosage of chemical, passes to the slow mixing chamber, a compartment of 20 feet square by 12 feet deep, which provides 35 minutes of gentle, continuous mixing, during which period the formation of the large floc takes place. The mechanical agitation is provided by a slowly operating shaft and propeller of the type manufactured by the Dorr Company for installation in the draft tube type of mixer.

After leaving the slow mixing chamber, the water passes to a single settling tank 40 feet square by 12 feet deep, providing two hours and twenty minutes retention at the rated capacity of the plant. The influent to the tank is through a trough running the entire length of one side. The trough is provided with an adjustable lip to secure uniform distribution. The effluent is collected in a trough extending along the opposite side of the tank. Both inlet and outlet troughs are behind baffles to prevent direct flow across the tank surface. The tank-cleaning mechanism is of the Dorr traction type. The sludge is withdrawn by pumping, a part being returned to the rapid mixing chamber, where it joins the inflowing water, and the remainder discharged to the sewer.

The Carbonating Plant

The carbonating basin consists of an L-shaped unit, having a retention period of approximately 24 minutes at the rated capacity of the plant. The carbon-dioxide gas, which may be generated by the burning of either gas or coke, for both of which facilities are provided, is purified through a scrubber and distributed through the water by means of a perforated pipe grillage located on the floor of the basin. During the winter months when the heating system is in operation, the CO_2 gas is secured from the stack of the coke-fired steam boiler for the heating system. The boiler is equipped with an automatic coke stoker equipped to protect against low water in the boiler, excess pressure and excess exit gas temperature.

The scrubber is designed to cool the gases from 500° to 100° F. It is brick-lined to prevent corrosion. The gas, after cooling, is compressed so as to be delivered through the perforated grillage system against the 12-foot water depth. The compressor automatically stops if the flow of CO_2 is shut off.

Recorders are provided to determine the percentage of CO_2 in the gas and the total flow of gas from the compressor. The guarantee covers combustion providing not less than 12 per cent CO_2 and entirely free of CO.

The Filters

The filters are two in number, each having an effective sand area of 12 feet x 14 feet 8 inches, which, with the rated capacity of 3 gallons per square foot per minute, are each capable of delivering 750,000 gallons per day.

The filter construction is the conventional type high rate, wash-water plant. The gravel layer, carefully graded, extends 24 inches above the floor of the filters, or approximately 21 inches above the center line of the laterals, which are of cast iron, 2 inches in diameter, with ⅜-inch perforations at 6-inch centers. Between the top layer of gravel and the filter sand, a 4-inch layer of No. 2 torpedo sand was placed to prevent the mixture of filter sand with the top layer of gravel. The filter sand, having an effective size of 0.45- to 0.50-millimeter, and a uniformity coefficient between 1.3 and 1.6, was next placed to a depth of 26 inches.

The temperature of the water remains practically constant throughout the year, so no provision was made for increasing the wash-water rate during the warm weather. The piping is designed for a wash-water rate of 15 gallons per square foot per minute equivalent to a 24-inch vertical rise, the water for washing being secured from the elevated tank and the pumps.

From the filters, the water drops through the venturi type rate-of-flow controllers to a clear well of 140,000 gallons capacity, located beneath the filters. From this clear well the high-lift pumping equipment, consisting of three 500-gallon-per-minute motor-driven centrifugals, takes its suction, and discharges to the distribution system and a 110,000-gallon elevated storage tank.

Construction Costs

The total of the contracts for the construction was $84,926, approximately $5,000 less than the engineer's preliminary estimate for the plant, well piping, and incidental work. The plant started operation early in January, 1932.

Personnel

The preliminary report, plans and specifications for the work were prepared by Alvord, Burdick & Howson, consulting engineers, of Chicago, who associated with them Charles P. Hoover, of Columbus, Ohio, on chemical matters. The contracts for the construction were let to the Burnip Construction Co., of Columbus, Ohio. G. F. Graham, Village Engineer, gave detailed supervision to the construction.

WORLD CONGRESS ON RECREATION

WIDESPREAD international interest in the first World Congress on Recreation, to be held in Los Angeles, July 23 to 29, just prior to the Olympic Games, is reported by the National Recreation Association, which is sponsoring the event.

President Hoover has accepted the honorary presidency of the Congress, and the State Department of the Federal Government has issued invitations to the diplomatic offices of the various countries. Delegates from twenty-two countries have already been designated.

The objectives of the Congress are: (1) to provide an international exchange of information and experience on play, recreation, and the recreational use of leisure: (2) to build interest and support for the movements in all countries; (3) to provide one further means of developing international goodwill. Discussions will be held on parks, playgrounds, games, athletics, and other leisure-time services organized and developed upon a community basis.

All correspondence should be addressed to T. E. Rivers, Administrative Secretary, International Recreation Congress, 315 Fourth Avenue, New York.

Mixed-in-Place Road Construction in the East

Interesting Results of Experimental Work in South Carolina, Massachusetts and Vermont

DURING 1931 several Massachusetts towns experimented most satisfactorily with mixed-in-place construction on township roads, and in Vermont an extensive program of this type of construction was laid out, including considerable mileage on Route 9 between Bennington and Brattleboro. Earlier experiments of great interest in South Carolina have recently been reported by the U. S. Bureau of Public Roads.

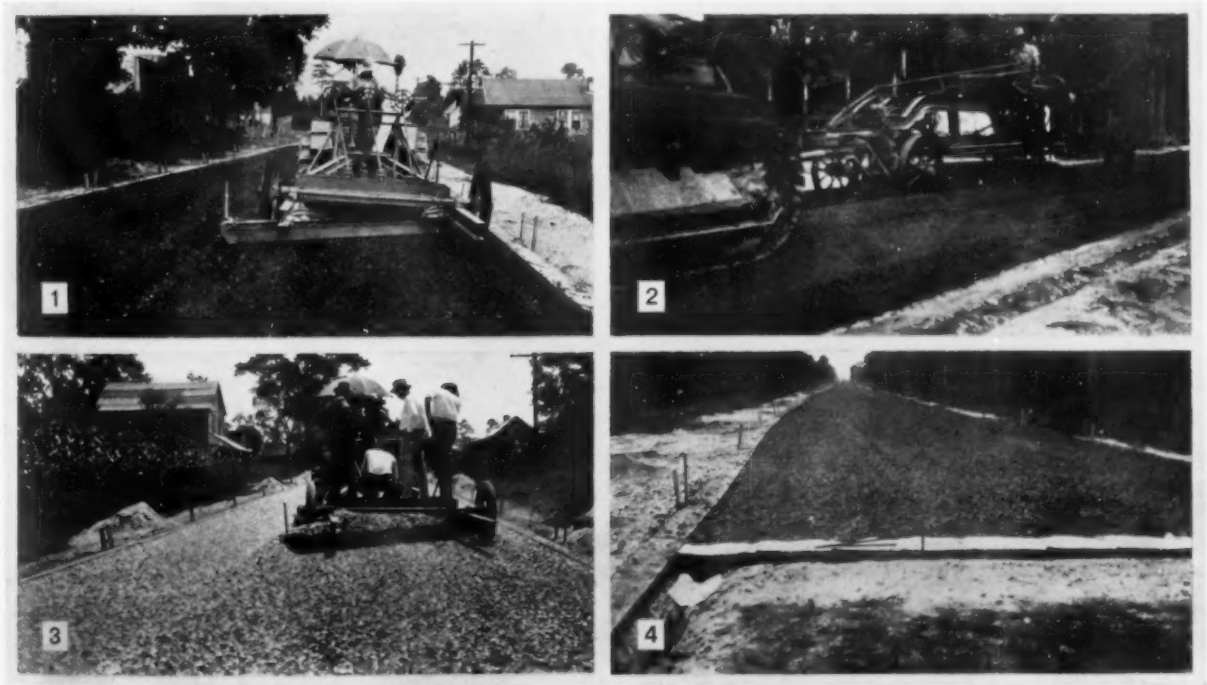
Mixed-in-Place Experiments in South Carolina

A cooperative experimental project was constructed during the summer and fall of 1929 in Berkeley County, S. C., by the State Highway Department and the U. S. Bureau of Public Roads. This project, 4.5 miles in length, was aimed to obtain information on the comparative value of sand-clay and marl as bases for bituminous surface treatment; on the comparative value of various types of bituminous material for cold application; on the effect of variously graded aggregates; and to secure a comparison of the wearing surfaces produced by the mixed-in-place method and by ordinary surface treatment.

This account is from a report by H. C. Jones, Division Engineer, South Carolina Highway Department, and E. L. Tarwater, Assistant Highway Engineer, United States Bureau of Public Roads, only recently published, showing the results of the mixed-in-place experiments.

Section 1B was the first of the mixed-in-place sections constructed, and was necessarily more experimental in character than the others. The tar prime coat was applied at the rate of 0.27-gallon per square yard, then 156 pounds of 1¼- to ¼-inch stone per square yard was cast between the forms from stockpiles at the sides and leveled off with the drag, after which a single application of 0.46-gallon per square yard of cut-back asphalt was spread. After this, 36½ pounds of the fine aggregate per square yard were spread as uniformly as possible with shovels, and followed by an application of 0.57-gallon of the same bituminous material.

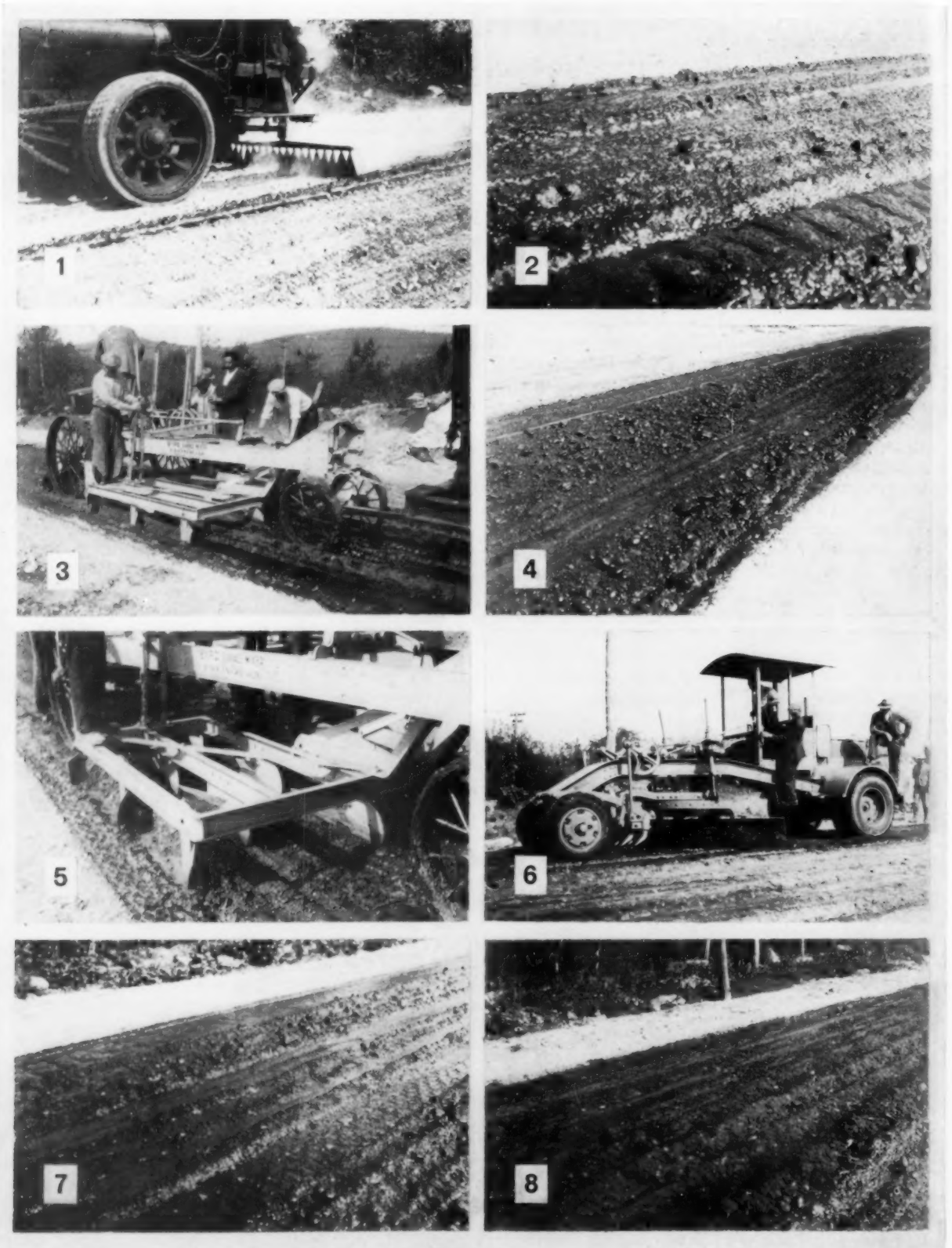
Mixing was begun immediately with a heavy four-way road drag pulled by a 10-ton tractor, but the results obtained were not satisfactory. The amount of aggregate was more than the drag could handle, and when the blades were raised to lighten the load, considerable material was necessarily dropped, so that after a few trips with the drag, it was distributed very unevenly throughout the section. A 12-foot road machine was then substituted for the drag and was entirely satisfactory for the mixing operation. Because of the unevenness of the surface caused by the drag, it was impossible to redistribute the mix to a uniform thickness with the blade grader, and for this reason considerable work was done by hand and with trucks during the spreading operation. The rate of mixing on this section was somewhat slow owing to the inexperience of



Photographs by courtesy of the U. S. Bureau of Public Roads

MIXED-IN-PLACE CONSTRUCTION IN SOUTH CAROLINA

1. Mixing with a heavy four-way drag did not prove satisfactory. 2. Mixing with a blade grader was entirely satisfactory. 3. The drag proved very satisfactory for smoothing the surface after the mixing operation had been completed. 4. The method of obtaining a thickened edge on the mixed sections by the use of both forms and trench



THE MIXED-IN-PLACE DEMONSTRATION AT LUDLOW, MASS.

1. Etnyre distributor making first appplication of hot Colphalt emulsion. 2. Appearance of the road after application of emulsion and before mixing. 3. The Byrd Surface Mixer on its first trip over the treated roadway. 4. The result of a round trip with the Surface Mixer. 5. A detail of the mixer. 6. Caterpillar patrol grader, which was used to scarify the road prior to treatment, spreading the mix. 7. Appearance of road surface after second application of the emulsion. 8. The road ready for final dragging and rolling after mixing was completed

the operators, with the result that mixing was not completed during the first day and the partly mixed material was left windrowed in the center over Sunday. By Monday morning a hard crust had formed on the outside of the windrow, but during the mixing this broke up readily. Final shaping and smoothing was done very successfully with the drag. Some hand-work was necessary, however, particularly along the edges. This was required on practically all the mixed sections.

During the mixing operation there was very little tendency for the aggregates to segregate or for the fine aggregate to ball up. Because of the stiffness of the mix, some segregation did occur during the final shaping of the section, with the result that the center 7 or 8 feet presented a more porous and open appearance than the remainder of the surface.

Rolling with a 10-ton, 3-wheel roller was begun immediately after final shaping was completed. As the operators were inexperienced and the roller was not in good mechanical condition, the rolling was not prosecuted as speedily or as efficiently as desirable, but was carried on intermittently for several days. A reasonable degree of surface smoothness was obtained, but it was evident that better compaction would have resulted had the construction operation been more rapidly carried out.

After about three weeks under traffic, it was apparent that a seal coat was necessary. The surface was porous, and raveling of the larger stone had started in numerous places. A higher percentage of fines in the mix, with a corresponding increase in cut-back asphalt, would have given a more closed surface and would probably have eliminated the necessity for a seal. The seal treatment consisted of 0.29-gallon per square yard of the same type of bituminous material that was used in the mix, and a cover of 15 pounds of ⅝- to ¼-inch crushed granite was spread by hand and rolled.

The cost of constructing the bituminous surface on this section was 72.58 cents per square yard, or $8,516 per mile for a 20-foot width. This cost was relatively high, largely because of the methods and delays in mixing and rolling.

The Next Section Produced a Closed Surface

Section 1A, 1,328 feet in length, was treated with a tar primer at the rate of 0.27-gallon per square yard. The mixed surface was constructed essentially in the same manner as in section 1B. The amounts of bituminous material used in the mix were 0.43- and 0.48-gallon per square yard respectively for the two applications. Mixing was done entirely with the blade grader. Initial rolling was done approximately 18 hours after mixing was completed, and in contrast to the previous section, a closed surface was obtained. This early rolling, having sealed a greater portion of the naptha in the mix, necessitated rolling only in the heat of the day to prevent cracking or checking and also to obtain maximum compression. The operation was continued for one week.

The section was then opened to traffic for one month, during which period the surface showed some signs of raveling and the need of a seal treatment. This was applied in the following manner: 15 pounds of ⅝- to¼-inch stone per square yard was spread and subjected to traffic for two days, after which the loose stone was swept to the sides and 0.42-gallon per square yard of the same material as used in the mix was applied. The stone at the sides was then re-spread on the surface and thoroughly rolled. After ten days under traffic, it was apparent that more cover stone was needed, and an additional 15 pounds was spread but not rolled.

This method of first applying the stone and subjecting it to traffic prior to the application of the bituminous material was tried out experimentally with the view of developing some suitable type of seal treatment for surfaces that were in a raveled or very open condition. It proved very effective, in that the action of traffic over the loosely spread stone forced it into the larger voids, requiring less bituminous material for the seal and preventing draining to the bottom because of the open surface texture. This method was used on some of the other sections where the surface conditions were similar to that mentioned above. The cost of constructing this section was 66.12 cents per square yard, or $7,758 per mile.

A Thicker Section with Larger Aggregate

Section 2A, in which the mix was 2 inches thick compacted, was first primed with tar at the rate of 0.31-gallon per square yard. The details of construction were essentially the same as in the preceding section, except that the aggregate used was 1¼- to ¼-inch in size with no fines added, and the bituminous material was applied at the rate of 0.69-gallon per square yard in a single application. The seal coat was applied three weeks later. On the portion from station 31 + 67 to 39 + 60 the same method of seal treatment was used as was employed on section 1A, that is, the stone was spread and subjected to traffic before applying the bituminous material. A total of 0.23-gallon of bituminous material per square yard and about 20 pounds of ⅝- to ¼-inch stone was used on this section. The method of seal treatment used on the remainder of the section consisted of an application of 0.38-gallon of bituminous material per square yard and covering with 15 pounds of ⅝- to ¼-inch stone. The cost of constructing the bituminous surface of this section was 70.34 cents per square yard, or $8,253 per mile.

Section 2B was first treated with the tar primer at the rate of 0.29-gallon per square yard. This section was constructed in the same manner as the preceding section. The amount of coarse stone used was 175 pounds per square yard. An application of ½-gallon of 25-35 viscosity tar was spread on the stone, but rain fell before mixing could be begun. On the following day when the materials were dried out and mixing was about completed, it was evident that more bituminous material would be necessary to secure a well-bonded mix. Accordingly, a second application of 0.39-gallon was spread, which, with additional mixing, produced a well-bonded mix. The total amount in the mix was 0.89-gallon per square yard.

The seal coat was not applied until after about two months, during which traffic was permitted to use the section. No raveling occurred, although the section was fairly open. The seal consisted of an application of 0.23-gallon of the same tar as used in the mix and 15 pounds of ⅝- by ¼-inch stone. After the stone was spread, the section was rolled. The cost of constructing the bituminous surface of this section was 79.40 cents per square yard, or $9,316 per mile.

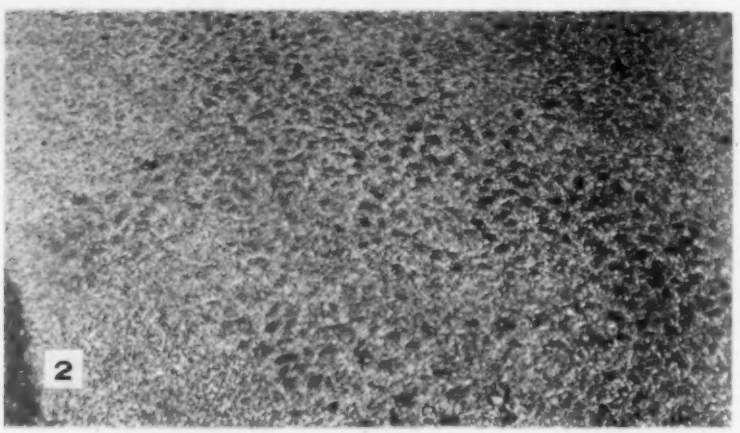
Discussion of South Carolina Experiments

In building a surface mat by the mixed-in-place method it is very important, particularly when using asphaltic mixed materials of the cut-back type, to have the mix in a condition of tackiness before compacting it either by traffic or by rolling. This is best accomplished by spreading and shaping the mix immediately after mixing and allowing sufficient time to elapse before rolling, in order that the light distillates may evaporate.

Another method commonly used is that of windrowing the material immediately after mixing and leaving it to cure before spreading and rolling. The latter method requires a longer curing period, is likely to cause segregation at the time of spreading and, in general, has proved less satisfactory than the first method, besides being somewhat more costly. There is also a possibility that some of the bituminous material may drain to the bottom of the windrow, causing the mix to be non-uniform and resulting in fat and lean streaks in the surface after the roadway is opened to traffic.

Experience has shown that a smoother and more stable surface can be obtained in the early life of a pavement by either of these two plans than can be obtained when the mix is laid and rolled before the proper tackiness has developed. Rolling the mix before an appreciable amount of the light distillate has volatilized, results in trapping this material in the mix, causing it to remain unstable for some time. It is believed that a considerable amount of mixed-in-placed construction with cut-back asphalt, compacting the mix immediately after mixing without sufficient time for curing, has resulted in early shoving and often in unsatisfactory surface behavior of the mat.

The ⅝- to ¼-inch stone used as cover material was not altogether satisfactory. A smaller size stone would have proved more satisfactory from the standpoint of waterproofing the surface. The larger size cover, however, resulted in added thickness and in the formation of some-



OTHER MASSACHUSETTS MIXED-IN-PLACE ROADS

1. A secondary road in Wilbraham, Mass. 2. Detail of the surface texture. 3. In foreground the type of drag designed and recommended by the State Department of Public Works for smoothing surface. Note that the drag is upside down. 4. Texture of mixed-in-place road in East Longmeadow, Mass.

what rougher mat with some of the larger stone projecting, rendering the pavement more skid-proof.

Work in Wilbraham and East Longmeadow, Mass.

Among the towns in Massachusetts which have built mixed-in-place roads with considerable success are Wilbraham and East Longmeadow. In Wilbraham, F. C. Phelps, Superintendent of Streets, resurfaced an 18-foot road at a cost of $1.00 per lineal foot of highway, using a graded aggregate and hand-cast peastone on the top. G. D. Robinson, Superintendent of Streets, East Longmeadow, put in an experimental mile of mixed-in-place surface at a cost of $1,500 for the mile. He used 0.6-gallon of heavy road oil and pit-run gravel, all material over 2½-inch screen size being excluded.

Experimental Sections at Ludlow, Mass.

At Ludlow, Mass., A. N. Boucher, Town Superintendent of Highways, built two sections of mixed-in-place highway, one with tar and the other with emulsified asphalt. On the first section 0.6-gallon of tar, furnished by the American Tar Co., was applied hot to the scarified surface and then mixed by a blade grader. The seal coat consisted of 0.5-gallon per square yard, and the mixing was completed with a multi-blade drag. This was designed and built according to the specifications of the State Department of Public Works of Massachusetts. The top was rolled with a 15-ton Buffalo-Springfield steam roller, the wheels being lapped once. The resulting surface is a firm, fairly uniform-textured asphalt pavement about 2 inches thick.

The use of emulsified asphalt for mixed-in-place work being entirely new in Massachusetts, the completion of the 1,000-foot section with asphalt emulsion on the Three Rivers-Ludlow Road brought out an attendance of road builders comparable to the attendance at a Road Show. The 18- to 20-foot gravel road was first scarified with a Caterpillar Sixty Patrol grader until the surface for a depth of 2½ inches was thoroughly loosened. One half of the road was then treated with ¾-gallon per square yard of Colphalt applied at a temperature of about 120 degrees F. by an Etnyre distributor. It was planned to use ½-gallon of the emulsified asphalt for the second application, and a final ¼-gallon if a seal were needed. Most of the previous experimental work with the emulsified asphalt had been done on roads with uniform aggregate, but this road had a high percentage of fines and hence a higher surface area of particles to be covered by the asphalt, and thus required a larger amount of asphalt on the second application.

As soon as the distributor had run the entire length, a Byrd surface mixer was pulled over the job by a Caterpillar tractor. This surface mixer has six mixing blades or double plow blades staggered in three positions fore and aft and adjustable to mix to depths from 2 to 5 inches. The six side blades on the machine are set to throw the material toward the center while the six double center blades effect the major portion of the mixing. Immediately behind the double blades are two semi-circular spreaders and one-quarter arcs on the outside. A heavy sloping spread bar is carried at the rear to effect a uniform surface after the passing of the surface mixer. The weight of the machine, pulled by a Caterpillar Thirty, was carried by two small steel wheels at the front placed on 4-foot centers, and two large-diameter steel wheels at the outside of the machine at the back just ahead of the spreader bar. Because of insufficient asphalt applied to the highway, the appearance of the mixed material was not entirely satisfactory, but after the second application of asphalt, amounting to approximately the same amount as the first application, and several round trips of the mixing machine, a uniform top was secured. In order to demonstrate the mixing qualities of the Patrol grader, one side of the road was handled almost entirely by the grader, which worked effectively when the regular maintenance blade was set with a decided forward slope so that the material rolled from the blade rather than being pushed along by it.

The experimental work at Ludlow was done under the direction of the Superintendent of Highways, A. N. Boucher, by Mace Moulton, Inc., contractors, Westfield, Mass., for whom J. E. Coburn was Superintendent. The asphalt emulsion was furnished by the Colphalt Co., Cleveland, Ohio, and the Byrd surface mixer by E. D. Etnyre Co., Oregon, Ill., through its Cambridge, Mass., office.

Building a Mixed-in-Place Highway with Gravel, in Vermont

The Department of Highways of Vermont during last summer did considerable mixed-in-place road construction using gravel. The first requisite for such work is an adequate base with proper drainage, that is, a base which will not break up in the spring. This is smoothed with a heavy road machine or drag and is then given the prime coat of 0.25-gallon of tar of about 10 viscosity. A surface of new gravel—in some cases crushed and screened—is then spread evenly on the road. It is found that by putting the stone particles on first and adding the sand after the application of bituminous material, better results are secured. The best results have been obtained where washed and screened gravel was used from which all silt and dirt had been removed.

The first application of tar, of about 20 viscosity, is made on this gravel at the rate of about 0.75-gallon per square yard. This is thoroughly mixed by means of a zigzag bladed drag 15 to 20 feet long hauled by a tractor or heavy truck. The mixture is then windrowed across the road with a blade grader of about 18-foot wheelbase. This makes sure that all the tar is picked up from the bottom and thoroughly mixed. The mixture is then spread out smooth by the grader and rolled.

The second application of tar, of 0.25-gallon per square yard, is then made and covered with a finer grade of gravel mixed smooth and rolled as before. In the first operation a very definite endeavor is made to get a thickness of about 1.75 inches, and on the second operation an added thickness of about 0.25-inch, giving a total thickness of about 2 inches. It is found that 1 gallon of tar, making a compacted thickness of 2 inches, is about the right amount of binder.

In Vermont the best results have been obtained by separating the sand from the stone, putting the stone on first to a depth of about 2½ inches loose, and applying the tar. This is followed immediately by about 30 per cent of the sand, which is mixed with the stone and tar, spread and rolled. A seal coat of 0.25-gallon of tar is then applied and covered with coarse sand, dragged

smooth and rolled. This gives a more uniform surface on which the stone forms a wearing surface with just enough fine material to fill the voids. With the same amount of tar, this practice builds about twice the thickness of surface that was obtained by the old surface treatment method of allowing it to penetrate.

The riding qualities of this type of construction are superior to those of other types of bituminous work constructed in Vermont. The cost of the surface course varies from $2,200 to $3,500 a mile, depending largely upon the distance the gravel must be hauled.

The information regarding Vermont practice was furnished by Hubert E. Sargent, Commissioner of Highways and Chief Engineer, Department of Highways, Vermont.

Activated Carbon Removes Tastes and Odors from Saginaw Water

By ALFRED ECKERT

Superintendent of Filtration, Saginaw Water Works

THE water supply of Saginaw, Mich., is pumped from the Saginaw River about 15 miles from its entrance into Saginaw Bay, Lake Huron. The water is delivered direct to the mixing chamber in the chemical building, where sufficient lime and soda-ash are added to reduce the hardness to 100 parts per million. The water then passes through deep coagulation basins equipped with mixing or stirring paddles and then to Dorr clarifiers, where the bulk of the sludge is removed. The effluent from the clarifiers is collected in a 60-inch pipe and carried to a 3-million-gallon settling basin. After the water has passed through the settling basin, carbon dioxide gas is applied in a separate chamber, and secondary settling is provided in another 3-million-gallon basin. The water then passes through the sand filters and is chlorinated on its way to the filtered water storage reservoir.

The effluent from the clarifiers, the settled water on its way to the filters, and the filtered water on its way to the reservoir, are all accessible in a central gate house through which the water passes in pipe lines.

Applying Powdered Activated Carbon

Access wells to these pipe lines readily permitted the installation or, rather, the utilization of existing equipment to apply powdered activated carbon. A standard Omega dry feed machine, originally installed to feed alum, is being used with very satisfactory results. The effluent from the solution tank under the dry feed machine is fed to a water eductor and then through a pipe line to the central gate house, where it may be injected either into the pipe line carrying water from the clarifiers on its way to the settling basins, or into the settled water on its way to the surface of the filters.

We have tried both points of application with satisfactory results. When it was applied on the surface of the filters, a mat of carbon was formed on the surface of the sand through which all water passing had intimate contact. The loss of head increased quite rapidly, but upon slightly jolting the filters, the loss of head decreased and resulted in satisfactory filter runs.

At the present time, the greater part of the carbon is fed to the effluent of the clarifiers at the entrance to a 60-inch pipe line carrying the clarified water to the settling basins. A long period of contact is provided, and the carbon which settles out in the basins stabilizes the sludge. A portion of the carbon is also fed directly to the incoming water by means of a by-pass on the effluent from the solution tank.

Effects of the Activated Carbon

Experience at our plant indicates that it is beneficial to apply carbon at such points that it is distributed throughout the entire body of water in process of purification. The softening plant sludge odor is effectively eliminated in this manner. Deposits of sludge which are not continuously removed, such as exist in the coagulation, carbonation and settling basins, are sweetened, and the sludge from the clarifiers which is continuously removed has a much less offensive odor than if no carbon is applied to the raw water.

It has been recommended that storage be provided for the wash water from the filters, to permit its uniform return to the incoming raw water. Not only would this result in a saving of treated water, but the carbon contained in the wash water would be sufficient to stabilize the sludge throughout the plant. All new carbon then added would probably be most efficient if applied directly to the surface of the filters, and a somewhat lesser amount than the present dosage would be sufficient.

The adsorption principle of activated carbon is explained by the Industrial Chemical Sales Corporation in this manner: When a liquid containing impurities is brought into contact with a carbon, the attraction of the carbon for the impurities is greater than the attraction of the liquid for the impurities. The carbon therefore adsorbs the impurities until equilibrium is reached, after which the carbon will no longer remove these substances from that particular solution.

Amount of Carbon Needed Varies with Different Waters

A number of methods of evaluating carbons for industrial uses have been developed, which are, however, of doubtful value for general use. Data regarding the action of carbons on one particular solution cannot be applied to another, and the same holds true of different waters. The amount of carbon found necessary to remove phenolic and algae tastes has varied greatly in different plants, and it may also vary considerably at any one plant. Tastes and

odors have been successfully removed from Saginaw River water over the greater part of a period of eight months, as evidenced by laboratory tests and the general use of the water for drinking at the water plant. It has been found, however, that the water in the distribution system has not consistently been free of objectionable tastes and odors. It is my personal opinion that considerable dirt and organic matter is still present in the distributing mains and will continue to be a source of annoyance. When an unusually high velocity is created in certain mains owing to hydrants being opened or as a result of shut-offs for repair work, we frequently receive calls from consumers who think that something has gone wrong with the filtration process.

Intimate contact between the carbon and the water to be treated must be provided. It would appear that the most intimate contact would be accomplished by filtering through a bed of carbon, but because of the great initial investment cost and the uncertainty of the life of such filter units, we felt at Saginaw that carbon in powdered form would better answer the needs. The advantage of using powdered carbon lies in the fact that the impurities are actually removed from the water with the precipitated sludge, but in the carbon filter beds the impurities accumulate and gradually decrease the efficiency of the units. There is still a lack of reliable and convincing data on the cost of upkeep of activated carbon filters as an adjunct to water purification in large plants. Behrman estimates that the additional cost of incorporating "Hydro-darco" treatment in a 10-m.g.d. plant is approximately $50,000, which does not include the somewhat intangible value that may be placed upon the storage space underneath the filters.

No accurate analytical method is known for definitely measuring the intensities and quantities of the changing character of tastes and odors in the raw Saginaw water, which are caused by both industrial and municipal pollution and algae conditions in the various streams uniting to form the Saginaw River. The judgment of the analyst and his ability to detect and evaluate tastes and odors in conformity with the methods described in Standard Methods of Water Analysis must be relied upon, but unfortunately the ultimate consumer does not always agree with the analyst as to the presence or absence of objectionable tastes.

Problems Encountered

The use of powdered activated carbon at Saginaw was started on March 9, 1931, and excellent results were obtained in taste and odor removal with 14 pounds of Nuchar No. 2 per million gallons, until about the middle of June. It is a significant fact that on or about the 9th of June an accidental spill of the contents of the two lower settling basins of an upstream chemical company occurred, which brought back the old familiar taste and odor. The carbon treatment was gradually increased to twenty-eight pounds per million gallons to take care of this situation, and it has been held close to this point since June, because of other factors entering into the taste problem. The flow of water in the Saginaw River during the summer of 1931 was below normal, which magnified the effect of industrial wastes from the chemical company. Severe algae and stagnation tastes and odors have also contributed considerably to the problem.

During the eight months in which powdered activated carbon has been applied to the water, four different grades of carbon have been used. Nuchar No. 2, Nuchar No. 00 and Nuchar No. 000, manufactured by the Industrial Chemical Sales Corporation and ranging in price from 5 cents to 10 cents per pound in car lots, have been tried on a plant scale. The results obtained with the cheapest grade of carbon were as good as those obtained with the higher-quality carbon. Carbex A, an activated carbon manufactured by the American Active Carbon Co., has also been successfully tried. In applying carbon to the surface of the filters, the denser carbon probably would give equally good results, and we are not yet convinced that it would not also be as effective in the clarified water.

A disadvantage in the use of powdered activated carbon is that, once a successful treatment has been established, one hesitates to reduce the amount applied. This is especially so in Saginaw, for we have no way of telling when a shot of bad-tasting water may enter the plant. It is entirely possible that we are overtreating with carbon part of the time, which, however, is objectionable only because of the cost, and it is also known that at times we have not added sufficient carbon. Just how great a factor of safety must be used to insure a continuous supply of palatable water from a source which varies in intensities of tastes and odors as the Saginaw supply does, is questionable. The additional cost of a few dollars per million gallons is warranted to help establish the confidence of the public in the water supply.

There may be some advantage in the addition of an excess of chlorine to break down compounds which chlorine attacks, and then using activated carbon for removal of the excess chlorine and other compounds not broken down by the chlorine. We expect to try this on a plant scale in the near future.

ACKNOWLEDGMENT.—From a paper read before the Sixth Annual Michigan Conference on Water Purification.

COUNTY PLANNING

IN the end the true value of planning in counties is found to rest on two primary bases. First, the opportunity offered to create such wholly new towns and cities and suburbs as Radburn, Boulder City, Palos Verdes, Shaker Heights, the Country Club District of Kansas City, and other communities which plainly show, without parallel examples of what might have been, the enormous advantages of forethought and planning and adherence to a well-thought-out general scheme.

It would be profitable, indeed, to show how permanent property values are in these later products of the planner's art, how little will have to be spent in future years providing more adequately for traffic and for the play of children, and what an abundant life these places make possible for the fortunate ones who can live in them. The merits of such development are so obvious that the prospect of securing more of them through the work of county planning agencies is alone sufficient to justify the maintenance of such commissions.

But there are even more obvious and convincing arguments for county planning found in the opportunities offered to save the taxpayers billions in future years. Money savings, often more effectively than abstract considerations of health, happiness or more comfortable human existence, will prove to doubters the worth of such work as we are engaged upon.

L. DEMING TILTON,
Director of Planning, Santa Barbara County, Calif.

Planning for Site and Development of the Municipal Airport

THE growth and development of civil aeronautics in the United States is due in no small measure to the establishment of airports and landing fields by municipalities and private interests. Of the 2,093 airports and landing fields on the records of the Department of Commerce on January 1, 1932, 636 are municipal airports, 673 are commercial airports, and the rest are Department of Commerce intermediate landing fields, Army airdromes, naval air stations, auxiliary fields and miscellaneous airports. The number of existing airports is by no means sufficient to meet the needs of American aeronautical progress. Cities and towns without airport facilities are realizing that they cannot afford to be omitted from the rapidly expanding air transportation system.

The problems of airport planning for municipalities are discussed in Aeronautics Bulletin No. 2, published July 1, 1931, by the Aeronautics Branch of the U. S. Department of Commerce, under the title "Airport Design and Construction." The following points are brought out:

In nearly all instances, the large city (100,000 and over) is faced with the necessity of providing one or more terminal airports so located that they will efficiently serve its widespread population with scheduled air transport and large-scale taxi service. In addition, there will be specialized airports furnishing round-house facilities and serving as ports from which such activities as sales, service, school, aerial photography, and crop dusting can be carried on. In the very large cities, it is believed, suburban air travel will grow to a marked extent in the next few years, in two classes: first, scheduled operations between the large city and small outlying communities; and, second, activities of private owners, who will commute daily to their offices by air from their estates within distances up to possibly 100 miles.

The Terminal Airport and Its Facilities

The terminal airport should have a large, well-drained, smooth, dustless landing area with clear approaches from all directions and equipped with suitably constructed runways, if these are necessary to insure the safety of all-weather operation. It should also be free from dangerous wind currents caused by nearby hills or buildings. In case the main airport is occasionally subject to fog, it should be supplemented by at least one auxiliary field outside the fog belt, where landings can be made safely.

In addition to the hangars and other buildings necessary for the maintenance and operation of the planes, there should be terminal facilities to care for the comfort of passengers. Adequate means should be provided for loading passengers and luggage into the planes with minimum discomfort and maximum safety. The airport should be equipped with some system of controlling traffic both in the air and after the plane has landed and should have adequate weather and radio services. The location should be such as to facilitate the exchange of traffic with existing agencies of transportation and to be conveniently accessible from the business section of the city.

In the case of medium-size cities, one or possibly two terminal airports may be expected to serve the community's needs for some time to come. There will probably not be the immediate separation into various services, such as may be expected in the metropolitan areas. Particularly in the smaller of the medium-size cities, miscellaneous operations may be expected to continue from the terminal airport. The instruction of students will probably be the first of such services to establish a separate airport, both from the point of view of the safety of the public riding in the transport planes, and also to facilitate flying instruction.

The growth of feeder lines carrying passengers, mail and express from the smaller to the larger cities may be expected, and in many cases these cities will be made stops on through air lines where a system similar to through and local train schedules may be worked out. The large transport planes operating between centers of population will be supplemented by smaller local planes which will concentrate persons desiring to catch through planes at designated points, and, in addition, will serve persons traveling between the small cities.

In the small community, the airport will accommodate miscellaneous air service as well as scheduled operations. In developing an airport for the small city or town, emphasis should be placed upon acquiring an adequate land area, even though the conditioning of only a portion is undertaken immediately. If practicable, control should be obtained of sufficient acreage to meet at least the minimum size requirements for a "1" rating on landing area, as defined by the Department of Commerce Airport Rating Regulations*; that is, either 2,500 feet effective length in all directions, or four landing strips not less than 500 feet wide by 2,500 feet in effective length, no two strips to intersect or converge at an angle of less than 40°.

Limited Airport Area Undesirable

Some communities have made the mistake of starting an airport project with a limited area located in such a way that expansion was impracticable because of paved streets, highways, railroads, or other permanent developments. Occasionally, the land has been graded and leveled, a hangar built, and lighting equipment installed on the airport, before it was discovered that the landing area was inadequate for the safe operation of transport planes. The Department of Commerce has repeatedly recommended for the small community that the funds available be used for the purchase and conditioning of land, and that hangars, lighting equipment, and other facilities may well come later as the use of the airport warrants.

Many small cities have not considered their prospects of fitting into an air transportation system as being very bright, and this fact has probably been one of the most important ones deterring them from establishing an airport, particularly where the small city was relatively near a large center of population. It is believed, however, that with terminal airports in the larger cities conveniently located with respect to the business centers and served by rapid-transit systems, there will be the aforementioned growth of suburban traffic, consisting of both privately owned planes and those making scheduled flights. Cities having scenic attractions in their vicinity, and cities that have become established as vacation centers, have the opportunity of developing tourist travel by air, equally, regardless of the size of the cities concerned.

Airport Planning in Relation to City Planning

Nowhere is there greater necessity for a carefully conceived city plan than in the matter of providing terminal

* See the following page.

facilities for air traffic. The various forms of surface transportation should be coordinated with air transportation in such a way that a ready exchange of traffic is facilitated. Existing transportation systems must be taken into account in choosing an airport site and future highway, and rapid-transit extensions should be planned to care for the increasing traffic to the airport which may be expected.

The location of an airport in a given area will probably stimulate the growth of that section and will tend to attract building operations of various kinds, some of which will be detrimental to safe operations from the airport. It is important that suitable steps be taken to protect the air terminals against such developments. Means of extending this protection through zoning or police powers and through eminent domain are discussed at length in the report of the committee on airport zoning and eminent domain, organized by the Aeronautics Branch of the Department of Commerce. Copies of this report may be obtained from the Aeronautics Branch.

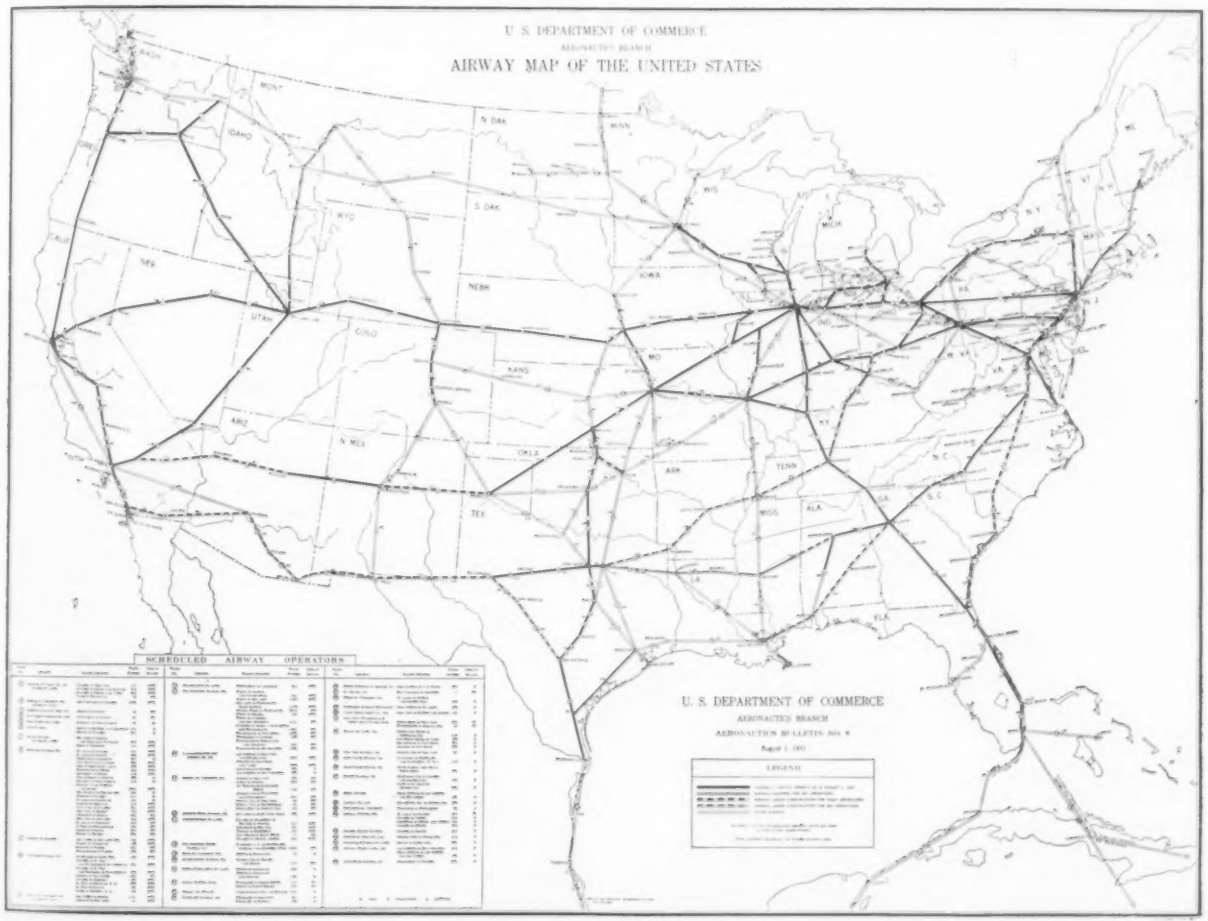
Landscaping of Airports

Most airports are either in process of development at the present time or so new that little attempt has been made to beautify them by landscaping and making them part of the cities' park and boulevard systems. In planning an airport, consideration should be given to appropriate landscaping and also to suitable architectural treatment as well as to the proper coordination of all activities on the port.

Airport Rating Regulations

The U. S. Department of Commerce has published, as Aeronautics Bulletin No. 16 of the Aeronautics Branch, the Airport Rating Regulations effective as amended September 1, 1931 (29 pp.). The following is a bare outline of the contents:

A statement of the legal obligation of the Secretary of Commerce to provide for such rating is given, and the terms "air-navigation facility," "airport," "landing strip," and "runway" are defined. Part I gives the general procedure in securing and maintaining airport rating, and deals with penalties and waiver of regulations. Under Part II the basic requirements are stated as to suitable landing areas, freedom from obstructions, accessibility, wind-direction indicator, markings, runways, drainage, fuel, communication, transportation, and personnel. The requirements on general equipment and facilities are given, on size of effective landing areas, and on lighting equipment. Part III gives the requirements for rating of airports for seaplanes. Combined landplane and seaplane airports are given two separate and distinct ratings as to their two sets of facilities.



This map, in its original size (22½" x 17"), was published as Aeronautics Bulletin No. 8 of the Aeronautics Branch of the U. S. Department of Commerce on August 1, 1931. In the box in the lower left-hand corner are listed 46 scheduled airway operators, in each case with a statement of the routes operated, the route mileage, and the class of service, the operators being indicated on the map by numbers in circles in the order of their establishment.

The solid black lines on the map show the Federally lighted airways as of August 1, 1931. The black lines with white space indicate airways under construction for night operations. The completely crosshatched white lines show airways equipped for day operations (Washington, D. C., to Norfolk, Va.; Dallas, Texas, almost to the eastern Mississippi state line; Houston, Texas, southwest to the Mexican line; and Great Falls, Mont., to Pocatello, Idaho). The partially crosshatched lines show airways under construction for day operations (Nashville, Tenn., to Dallas, Texas; and San Antonio to Big Springs, Texas). The double-rule lines indicate other airways.

Some Legal Aspects of the Problem of Blighted Areas and Slums*

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THE legal aspects of the slum problem comprehend preventive measures as well as curative methods. They involve also both the police power of the state under which the community takes action regarding private property without compensation and the power of eminent domain under which compensation must be paid by the governmental authority for the expropriation of private property rights.

Preventive Measures

Zoning.—This comparatively new but well-established and accepted method of community regulation of uses of privately owned realty is unquestionably of large significance in dealing with the problem of blighted areas and slums. Care must be exercised in its application that it be kept within the limits laid down by the Supreme Court of the United States in numerous decisions[1] but within these limits it may be employed as a *preventive of blight* by allocating uses in accordance with well-conceived city plans and the stabilization of such uses and of values.[2] Properly applied and administered, it will prevent new slum conditions by the control of population densities through requirement of suitable open spaces about residences and the limiting of bulk of buildings.

Zoning cannot properly be considered as an instrumentality for the acquisition of land for housing purposes. Its only proper function is to create and protect an environment suitable for the various uses of land including the residential use.

Housing Laws.—In some states and municipalities there are in effect housing codes designed to maintain sanitary and safe housing conditions. These laws depend for effectiveness upon an adequate inspection system and upon an understanding administration. There is need for more such enactments and for more vigorous enforcement of those now in effect. There should be, also, a gradual raising of the minimum standards set up in the laws.

The Committee recognizes that housing codes and their enforcement cannot solve the slum problem, but they are essential to its solution and they have been the means of accomplishing most of the little that has been accomplished in our cities.

Remedial Measures

One of the greatest difficulties in the slum problem is the acquisition of land at a price that will permit the construction of new buildings at rentals within the economic ability of the tenants to be rehoused, and that will permit, at the same time, a satisfactory return on the investment.

Possible Remedial Agencies.—It is desirable that a way be found to overcome this difficulty. What are methods by which this problem may be attacked?

The desired end may be accomplished through a combination of the following methods: it may be through the demolition of existing buildings as a safety or health measure; zoning may play a part; the solution may be through the exercise by the public of its power of eminent domain with the sale or leasing of the property for development by private enterprise, or by the granting of the power of eminent domain to private enterprise; through the exercise of the power of excess condemnation by the municipality; or through a further extension of the latter power permitting the leasing of the condemned excess property to private enterprise with the grant to the lessee of the right to mortgage the city's fee interest to obtain finances for building operations as recently granted to the city of New York.

Police Power

Demolition of Buildings as a Safety or Health Measure.—The constitutionality of statutes authorizing the destruction of buildings deemed fire hazards is established.[3] Instances of condemnation or summary destruction, under the police power, and without compensation, of structures that are faulty and dangerous or unsanitary are less common but are well established. Those structurally unsafe may be required to be demolished, but those found unfit only because of unsanitary conditions may still be utilized for other purposes and may even be reconditioned and used as dwellings. At best, the full exercise by the public authorities of their power in such cases would result in the elimination of comparatively few dwellings—a number probably so inconsiderable as to make but little impression upon the existing deplorable housing conditions of a large body of our people. That is not to say that there should be a slackening of efforts to enforce safe and sanitary conditions under existing authority—rather merely to point out that some much more effective method must be devised to make possible a more speedy and a more far-reaching remedy.

As to the use of the police power in the clearing of slum areas—it must be tried out in the courts. No one can safely predict a court decision upon this point. Early decisions in some states held zoning unconstitutional. The police power is "community" power and is constantly developing to cover new needs. If the community regards slums as *sufficiently* detrimental, it is possible that the courts might uphold their condemnation without compensation.

In *Block v. Hirsh*, 256 U. S. 135 (1921) it was decided regarding housing shortage existing in the District of Columbia following the war:

"(2) That the exigency existing in the District clothed the letting of buildings there with a public interest so great as to justify regulation by law, i.e., by the police power of Congress,—while such exigency lasts." P. 155.

* Adopted as a supplementary report by the Committee of Blighted Areas and Slums of the President's Conference on Home Building and Home Ownership.

[1] *Euclid v. Ambler Realty Co.*, 272 U. S. 365; *Nectow v. Cambridge*, 277 U. S. 183; and *Seattle Trust Co. v. Roberge*, 278 U. S. 116.

[2] See Report of Committee on City Planning and Zoning, of the President's Conference on Home Building and Home Ownership.

[3] *York v. Hagardine*, 171 N. W. (Minn.) 773 (1919); *Runge v. Glerum*, 37 N. D. 618 (1917); *Jackson v. Bell*, 143 Tenn. 452 (1920).

In *Levy Leasing Company, Inc., v. Siegel*, 258 U. S. 242, the constitutional validity of the emergency housing laws of the state of New York was established; Justices McKenna, Van Devanter and McReynolds dissenting.

In *Miller v. Schoene*, 276 U. S. 272, at 279, the Court said:

". . . . The state does not exceed its constitutional powers by deciding upon the destruction of one class of property in order to save another which, in the judgment of the legislature, is of greater value to the public."

The Supreme Court of the United States has said:

"That power [police power] . . . . embraces regulations designed to promote the public convenience or the general prosperity as well as regulations designed to promote the public health, the public morals, or the public safety. . . . . That power is not confined, as we have said, to the suppression of what is offensive, disorderly or unsanitary. It extends to so dealing with the conditions which exist in the state as to bring out of them the greatest welfare of its people."[4]

In a previous case[5] the expansion of the community power is predicted by the Supreme Court of the United States in the same terms as the above quotation, and the Court said:

"And the validity of a police regulation, whether established directly by the state or by some public body acting under its sanction, must depend upon the circumstances of each case and the character of the regulation, whether arbitrary or reasonable and whether really designed to accomplish a legitimate public purpose.

Zoning.—The function of zoning has been mentioned under "Preventive Measures," where it more properly applies than under acquisition of land.

Building Lines.—The establishing of building lines or setbacks under the police power to provide for adequate front yards on private lands and by eminent domain as a means of providing adequate streets for future use is a practice in many cities. Under the police power, that is in this case zoning, the regulation must be reasonable and not arbitrary,[6] but it applies as well to commercial buildings as to dwellings.[7]

Eminent Domain

This is the power through which the state or municipality may take over, for a just compensation, private property for public use.

Eminent Domain Powers Granted Private Persons.—Such powers have been granted to private persons by the law of New York State.[8] Some years ago the Legislature of that State enacted a law which is administered by a State Housing Board created for the purpose and under which private or public limited dividend corporations may be set up. The private corporations have no power of eminent domain, but the public corporations are granted this power in return for which they must submit to specified public regulation.

Both public and private limited dividend corporations are limited to a 6 per cent return upon their investment and are granted an exemption from taxes upon their buildings for a period of twenty years. No public corporations have been created, but several large projects have been built by private limited dividend corporations in New York under this law,[9] and in each case a satisfactory return on the capital investment has been realized. Early effort in New York was directed toward interesting philanthropically inclined persons to invest their funds in this type of enterprise. The amount of such funds available on this basis is not sufficient for the purpose, however, and commercial capital is required if any great progress is to be made.

The plan of the New York statute in giving to housing corporations important concessions as to tax in return for confining their profits to a limited dividend seems a good plan and raises no objection, so far as the Federal Constitution is concerned. In *American Sugar Refining Co. v. Louisiana*, 179 U. S. 89, the Court said that exemptions of certain classes of business which the various states wished to foster was not uncommon, and the exemption of certain classes of property to foster the general welfare is not unusual. The holding was that there is no constitutional obstacle to the tax exemption feature. In the absence of some constitutional prohibition, the states have power to exempt, providing the exemption is uniform and does not result in inequality. Many of the states, today, exempt factories, mills, and manufacturing plants for a certain number of years. California uses tax exemption to encourage fruit-tree planting and vineyards; Connecticut encourages tree planting; Georgia exempts for five years nearly all kinds of industry; Idaho exempts power plants of irrigation concerns; Louisiana exempts large corporations which expend three million dollars in the state; Maine exempts reforested tracts; Maryland exempts vessels; Michigan, forests; New Hampshire exempts shipbuilding industry; New Mexico, irrigation ditches; New York, certain commercial paper; Oklahoma, farm products. These references are made to show how a state may *encourage* any particular private enterprise which seems desirable. The exemptions, of course, are for a limited time.[10]

Excess Condemnation.—The attempt to get rid of objectionable slums or to clear entire areas or districts may be facilitated by the use of the so-called power of "excess condemnation." It will be found in the United States—as it has been found in other countries—that in such work it is generally necessary to replan the area cleared and often to devote it in the future to quite different uses from those employed in the past. In some cases the cleared sites may be used for street widening, or for new streets, or for small parks or playgrounds, or recreation centers, or for public buildings; but in many cases no such use will be appropriate and it will be found desirable to provide new housing accommodations on these sites.

Under excess condemnation the municipality may acquire more property than is needed for a specific public improvement, such as a street widening or the development of a park, and it may lease or sell the property not needed for that specific purpose, and have it developed with a new housing scheme by private enterprise under control and restrictions.

The status of excess condemnation laws in the United States is somewhat uncertain. Two years ago the important case of *Cincinnati* v. *Vester*[11] raised squarely the issues involved in this subject. It involved the validity of a provision of the constitution of the state of Ohio. The case was very thoroughly briefed and numerous briefs were filed by friends of the Court and public officials in other jurisdictions.

The constitution of Ohio provides in express terms that:

"in furtherance of such public use [the city may] appropriate or acquire an excess over that actually to be occupied by the improvement, and may sell such excess with such restrictions as shall be appropriate to preserve the improvement made." (§ 10 Art. 18 of the constitution of Ohio.)

The Supreme Court, however, did not decide the issue, but referred it back on technical grounds to the lower courts, leaving the whole matter open.

That this power is an important one and that its use has been contemplated since the earliest days in the United States,

[4] *Bacon v. Walker*, 204 U. S. 311, 317, 319.
[5] *C. B. and Q. Railway v. Drainage Commissioners*, 200 U. S. 561, 592.
[6] *Gorieb v. Fox*, 274 U. S. 603.
[7] *Town of Islip v. Summers Coal & Lumber Co., Inc.*, 257 N. Y. 167, 177 N. E. 409. See "Set-backs or Building Lines by Zoning or Otherwise," Charles P. Fisher, Planning Problems of the Town, City and Region, 1928, p. 73; "Recent Trends in Building Lines, Subdivision Control and the Acquisition of Open Spaces," Alfred Bettman, Planning Problems of the Town, City and Region, 1929, p. 102; and "Theory and Practice in Building Lines under Eminent Domain," Herbert Swan, in Supplement to *National Municipal Review*, Vol. XX, No. 9, Sept. 1931.
[8] N. Y. State Housing Laws, Laws 1926, ch. 823, reenacted and amended by Laws 1927, ch. 35, amended by Laws 1928, ch. 722, amended by Laws 1930, ch. 872.
[9] See Annual Reports, State Board of Housing, New York.
[10] See Baker, 7 Tex. L. R. p. 50; Baker, 7 Tex. L. R. p. 385; Baker, 8 Tex. L. R. p. 196.
[11] *Cincinnati v. Vester*, 281 U. S. 439.

is evident from the fact that as long as a hundred years ago several states enacted laws of this nature—South Carolina in 1817 and New York in 1812.

At later times the following states have enacted such laws:

Connecticut, Illinois, Maryland, Massachusetts, New Jersey, New York, Ohio, Oregon, Pennsylvania, Philippine Islands, Rhode Island, South Carolina, Virginia, Wisconsin. The following states have also amended their constitutions to permit the exercise of this power: Massachusetts, Ohio, Wisconsin, New York, Rhode Island, Michigan, California, Virginia.

It is believed that if the excess condemnation were definitely for, and clearly stated to be for, the specified purpose of protecting the improvement made, it would be sustained. Moreover, as a general rule, the extent of a taking rests with the condemning authorities and it requires a clear abuse of discretion before a court will intervene. The only way to determine the extent to which power of excess condemnation may be utilized is to try it out under carefully drawn authorization and to learn what, if any, limitations courts of last resort will place on the exercise of the power.

It is hoped that an early decision may be had by the court of last resort, the United States Supreme Court, with regard to this subject, in view of its great importance not only in slum clearance but in any effective and economic replanning of our great cities.

Excess Condemnation—Lease with Right to Mortgage.—There has recently been enacted in New York State a law[12] granting to the city of New York additional powers in connection with excess condemnation. As we have said, under excess condemnation the city takes over such property as it considers necessary to protect a public improvement. This new act permits the city to lease such of this property as it may deem advisable, granting to the lessee the right to mortgage for a stated term the fee interest of the city, thereby facilitating the financing of a building project. Under such a plan funds are more readily obtainable, as the security of the mortgagee is then the fee interest in the property rather than a leasehold interest, and the amount that must be raised to carry on a successful building operation is considerably less. This power may well be studied with a view to working out a law suitable for enactment in our other states so that, to the extent that it seems desirable, it may be exercised by other municipalities.

Exercise of Eminent Domain by Public Body for Housing-Site Acquisition.—There would seem to be little doubt that public authorities, the state, county, or municipality, may exercise the power of eminent domain to acquire sites now occupied by undesirable or slum dwellings for the purpose of turning such sites over to private enterprise for development of suitable residences, since the right of eminent domain is granted to limited dividend corporations and is the basis of excess condemnation. The question is whether or not the acquisition of such sites is a public purpose for which this power may be exercised, and for which public funds may be utilized. What is a public purpose cannot be defined with great definiteness. Decisions of the courts vary. In a review of them, however, we must consider the trend of public opinion in matters having a large social significance.

In *Lowell v. City of Boston*, 111 Mass. 454, (1873) a statute authorizing the city of Boston to issue bonds and to lend the proceeds on mortgage to owners of land whose buildings were destroyed by the fire of 1872, was held to be unconstitutional, the Court saying (page 472):

"The property thus created will remain exclusively private property to be devoted to private uses at the discretion of the owners of the land; *with no restriction* as to the character of the buildings to be erected or *the uses to which they shall be devoted, and with no obligation to render any service or duty to the Commonwealth, or to the city*,—except to repay the loan,—*or to the community at large or any part of it*. . . . . As a judicial question the case is not changed by the magnitude of the calamity which has created the emergency nor by the greatness of the emergency, nor the extent and importance of the interests to be promoted." [*Italics ours.*]

This case has frequently been cited for the proposition that the use of public credit to assist private enterprise is beyond the constitutional powers of the state. (Many states forbid the lending of the credit of the state or of a municipality to any private enterprise.)

In *Salisbury Land & Improvement Company v. Commonwealth*, 215 Mass. 371 (1913), an act giving eminent domain powers to a commission to take beach property as a public reservation and to sell or lease privately the portions not needed, was also held unconstitutional. Rugg, C. J., delivering the opinion of the Court, said (page 377):

"In a general sense it is of public interest that the people be well housed, but this does not authorize the state to become the general landlord. That subject is a proper one for the exercise of the police power, but not of eminent domain."

In the Opinion of the Justices, 155 Mass. 598 (1892), the Legislature is not empowered to authorize cities to purchase fuel and resell to the inhabitants, Holmes, J., dissenting.

Of course, Massachusetts is a very conservative state. Nevertheless, it might make a difference if the character of buildings to be erected or of the uses to which they would be devoted were prescribed. Perhaps a portion of the property could be utilized for parks and playgrounds; the buildings primarily intended for housing city employees.

In 26 *R. C. L.*, under the heading "Taxation," Section 35, page 53, it is said, citing cases:

"While the fundamental principles which underlie legislation and taxation have not changed, the development of the western states has been attended with difficulties and adverse conditions which have made it necessary to broaden the application of fundamental principles to meet the new necessities of those states. Under the stress of adversity peculiar to the condition of the frontier farmer, there has come to be an expansion of the legal meaning of the term 'poor' sufficient to embrace a class of destitute citizens who have not yet become a public charge. For this reason statutes for the relief of farmers who have lost their crops through drought, hail storms, insect pests or other causes have become common, and are sustained on the ground that it is for the public use to prevent industrious members of the community from becoming a public charge."

In *Wheelon v. South Dakota Land Settlement Board*, 181 N. W. 359 (1921), annotated in 14 A. L. R., 1145 and following, the first and fifth paragraphs of the syllabus are:

"1. A statute authorizing loans to war veterans to enable them to purchase land is not a personal gratuity or donation forbidden by the constitution."

"5. The promotion of land settlement is a public purpose for which taxes may be levied."

The annotation on the question of constitutionality of statutes authorizing the state to loan money or engage in business of a private nature is very complete.

Just recently it was decided in *Sacramento Chamber of Commerce v. Stephens*, 299 Pac. Rep. 728, it is a public purpose for California cities to expend public funds for advertising and otherwise calling attention to their natural advantages.

In *Loeb v. Jacksonville*, 134 Southern Reporter, 205, the Florida Supreme Court reached a contrary conclusion.

In a note in 21 *Columbia Law Review*, (February, 1921) page 172, on "The Limitation of the Action of Ejectment and of Summary Dispossess Proceedings," at page 174, the writer says, citing cases:

"But the public nature of a business depends largely upon the current notions of what businesses should be subject to legislative attention. Why is not the business of house-renting a public business, if the Legislature, knowing all the facts, declares it a public business?"

The *National Municipal Review* for October, 1931, (Volume XX, No. 10, p. 607) contains a note by Professor Tooke, on a recent case, summarized as follows:

"In *Simon v. O'Toole, City Clerk*, 155 Atl. 449 (N. J.), a taxpayer's action was brought to test the validity of an ordinance adopted by the Commissioners of Newark, which authorized the execution of a contract with the Prudential Life Insurance Company whereby, in consideration

[12] Laws New York, 1931. Ch. 557.

of the latter's purchase of two city blocks and the erection thereon of model tenements the city would undertake to take over a strip 140 feet wide in the middle of the blocks so acquired at the price paid by the company to be maintained as a public park and playground. The Supreme Court held that the ordinance was within the general powers of the city; that the expenditures authorized were for a public purpose and not to aid a private enterprise; and that the price to be paid by the city, which in no event was to exceed $1,200,000, was not an abuse of the discretion of the Commission."

The learned commentator says that it seems self-evident the establishment of playgrounds and sanitary housing is a public purpose for which the city may exercise its taxing power.

In *Green v. Frazier*, 253 U. S. 233, 241 (1920), legislation which provided for the state engaging, among other things, in providing homes for the people with public funds, was upheld, the Court saying (pages 241-242):

"As to the Home Building Act, that was sustained because of the promotion of the general welfare in providing homes for the people, a large proportion of whom were tenants moving from place to place. It was believed and affirmed by the Supreme Court of North Dakota that the opportunity to secure and maintain homes would promote the general welfare, and that the provisions of the statutes to enable this feature of the system to become effective would redound to the general benefit.

"As we have said, the question for us to consider and determine is whether this system of legislation is violative of the Federal Constitution because it amounts to a taking of property without due process of law. The precise question herein involved so far as we have been able to discover has never been presented to this Court. The nearest approach to it is found in *Jones v. City of Portland*, 245 U. S. 217, in which we held that an act of the state of Maine authorizing cities or towns to establish and maintain wood, coal and fuel yards for the purpose of selling these necessaries to the inhabitants of cities and towns, did not deprive taxpayers of due process of law within the meaning of the Fourteenth Amendment. In that case we reiterated the attitude of this Court towards state legislation, and repeated what has been said before, that what was or was not a public use was a question concerning which local authority, legislative and judicial, had especial means of securing information to enable them to form a judgment; and particularly, that the judgment of the highest court of the state declaring a given use to be public in its nature, would be accepted by this Court unless clearly unfounded."

In *O'Gorman & Young v. Hartford Fire Insurance Co.*, 282 U. S. 251, 257, the Court decided the business of insurance is so far affected with a public interest that the state may regulate the rates, and likewise the relations of those engaged in the business. The majority opinion said (p. 257 bot.-8):

". . . . the presumption of constitutionality must prevail in the absence of some factual foundation of record for overthrowing the statute."

So the decisions vary from the one extreme of denying the use of the power for acquiring land and leasing it in Massachusetts to the other extreme of upholding a state government housing project in North Dakota. The decision of the United States Supreme Court in this latter case is an encouraging precedent.

Some state constitutions would have to be amended if the power of eminent domain were to be used to acquire sites for housing developments. However, this use of eminent domain would not conflict with Federal constitutional guarantees which provide that property shall not be taken without just compensation or without due process of law or that private property may be taken only for public purpose. These provisions are sufficiently broad to accommodate this proposal.

Here, again, the only way to determine what can be done with this method of site acquisition is to carefully work out the proposed authorization, apply it judiciously and, if questioned in the courts, extend every effort to support its validity.

It is possible that the present system of condemnation awards by juries in cases of expropriation of land may be improved upon in the interest of the public. An expert appraisal board of public-spirited and socially minded persons of suitable qualifications might be set up to serve with or without compensation in each city for the purpose of determining fair values of properties that might be considered for condemnation for housing purposes. Something of this kind has been utilized successfully for years in Philadelphia. In the condemnation proceedings these experts might submit their impartial testimony to the court, or to a master or referee, who would then fix the amount to be awarded.

Eminent Domain—Lease or Sale for Rebuilding.—This Committee believes that a combination of governmental aid in the clearing of sites and of private enterprise in rebuilding upon them offers a more practical solution for the slum problem than does the rehousing entirely by public authority.

If the power of eminent domain is exercised by public authorities for the acquisition of land for housing purposes, the Government might dispose of the land at a fair price or at cost to private persons for the purpose of housing development with possibly some power of regulation as to acceptability of plans being retained by the governmental authority, or the property might be leased on suitable terms by the city for similar development by private enterprise and under similar safeguard.

Study Recommended.—All of these possibilities should be thoroughly explored by a competent body of national scope in order that we may know what methods are available for attacking the problem, that the one most suitable, locally, may be resorted to.

Federal Bond Issue Unauthorized

It is believed that there is no warrant in the Constitution of the United States for the issuance of long-term bonds to aid in rebuilding in the states. It does not appear to be included within any of the powers granted to the Federal Government by the states. The Federal Government possesses only those powers expressly or impliedly conferred upon it by the United States Constitution. (*South Carolina v. United States*, 199 U. S. 437.) Any action by the Federal Government in a field not covered by the constitutional grants is void. (*Karem v. United States*, 121 Fed. 250, C. C. A. 6th [1903].) The Federal Government has no police power as such. (*United States v. DeWitt*, 9 Wall. 41.)

City without Implied Right to Enter Housing Business

THE city in Orlando, Fla., has recently been involved in litigation the result of which emphasizes the restriction upon a city's engaging in a housing enterprise without express statutory authority. In a letter to THE AMERICAN CITY Mr. Seasongood has called attention to this case because of its bearing on the foregoing report.

A general statute of Florida gives to municipal corporations "full power and authority to take and hold property, real, personal and mixed, and to control and dispose of the same for the benefit and best interest of the corporation." Under this law Orlando undertook to acquire an apartment house and operate it as an investment; but the United States Circuit Court of Appeals (Fifth Circuit) held that the contract was beyond the power of the city and therefore void (*Hoskins v. Orlando*, 51 Fed. 2d, 901).

In commenting on this case in *National Municipal Review*, December, 1931, page 727, Professor C. W. Tooke of New York University says:

"The general power of a municipality to purchase property is limited to such property as is needed for municipal purposes (*Lewis v. Shreveport*, 108 U. S. 282). It buys and operates with money to be raised by taxation and its implied power cannot extend beyond what is necessarily needed to carry out its express powers. In the absence of a statute expressly conferring upon municipalities the power to undertake housing enterprises or declaring such an activity a public purpose, an attempt to engage in such private business will not be upheld."

It will be noted that the Orlando case evidently does not involve the usual police-power considerations of public health, safety, morals or welfare.

The Drill School in Small-Town Fire Department Practice

By **W. W. STEPHEN**
Chief of Fire Department,
Swann Chemical Company, Anniston, Ala.

THE institution of the drill school has had a far-reaching effect in improving fire department technique and reducing losses and water damage in North American municipalities. This method of training, in a modified form, may have an essential place in the operation of any small-town or village department, and the knowledge and experience of men who are the masters of the science of fire fighting may thus be available for use in instructing the personnel of even the smallest volunteer organization.

The writer has in mind a specific case that was a part of his own experience.

In a town of approximately 2,000 population, the Department, an entirely unpaid organization, was equipped with a flivver hose truck, an old service ladder truck and a reel for reserve hose. Alarms came in by phone. The policeman on duty at the Town Hall at night acted as apparatus driver, and during the day one of the several other drivers was employed in a drug store next door to the Town Hall. The response of at least one piece of apparatus to alarms was therefore just about as fast as that of a paid company would have been, its effectiveness, however, depending in some measure upon how quickly other Department members got to the fire.

A Sample List of Evolutions

The men were drilled at least once a month during the season of cold weather, and every two weeks, or more often, at other times. The following evolutions were employed, having been "boiled down" from the long list practiced by the New York Fire College:

No. 1.—Stretch line of 2½-inch hose from hydrant to place designated to represent fire, coupling to plug, pulling off slack, breaking line and attaching play pipe, etc. Officer in charge to order water started at whatever point of evolution he deems necessary. At actual fires, with fast men breaking the line, water may be started while line is being laid, unless line is to go up a ladder.

No. 2.—Stretch line of 2½-inch hose from fire location to hydrant, using double male and double female connection. Truck to return at once to fire location, to make available ladders and other apparatus.

No. 3.—Take 50-foot extension ladder from service truck and raise to building used for drill tower. Lower ladder. This to be done by six men.

No. 4.—Take 28-foot straight ladder from service truck and raise. Lower ladder. Use three men.

No. 5.—Take 24-foot extension ladder from hose truck and raise. Take roof ladder from apparatus, open hooks, pass it up extension ladder and place roof ladder on slope with hooks over ridge pole.

No. 6.—Carry flat line of hose up ladder to roof, with slack on roof. Fasten line to ladder with hose straps.

No. 7.—Carry charged line, with controlling nozzle closed, to roof and fasten line to ladder with hose straps.

No. 8.—Close nozzle control on charged 2½-inch line. Take off nozzle tip. Couple on section of 1¼-inch hose, with small controlling nozzle. Open control of large nozzle.

Drills were held in a number of places, including the main street, side streets, alleys in the business district and dwelling houses in the residence district. The house where the Chief lived, which had a wide front yard with a hydrant in front of it, was used a number of times. The walls and roof of a building, on each occasion, were used for a drill tower.

Two fires, during the ten years in which the writer was associated with this Department, occurred in buildings on which practice evolutions had been performed. On one of these occasions the fact that the Department was absolutely familiar with putting up ladders on this building and avoiding the many light and power wires near it, proved a decisive factor in quickly stopping the fire.

While each Department member was detailed to a specific duty, such as that of plugman, hoseman, pipeman, ladderman, etc., they were taught to be able to carry out any task that might, in the course of circumstances, fall to their lot.

In the present day of automobiles and other amusements, and especially in the case of a small town situated near a larger municipality, there is no guarantee that a fire alarm will not find a goodly percentage or even a majority of the members of a non-paid department out of town and anywhere within a radius of one hundred miles. Furthermore, it may take some minutes for all the firemen that may be in town to arrive, and it may be therefore necessary for a skeleton crew composed of the first few men present to stretch and operate the first hose lines in whatever order they happen to get there, rather than according to the positions originally assigned to them.

Results of Organized Drill

The success of any drill school may be measured by an appraisal of the technique of the organization trained by it. In the small Department we have been discussing the effect of the drill school was most certainly apparent. About twenty alarms a year, including calls to adjoining towns and villages, were answered, and in many cases serious water damage was avoided by the careful handling of fire streams, the use of 1¼-inch hose, and the employment of canvas shelter tent halves for salvage covers. (The Department never had the funds to buy salvage covers. It was practically self-sustaining, causing the town little or no operating expense.) Ventilation was correctly practiced and several times aided materially in making quick stops of blazes that would have been, in a small town, of threatening proportions.

The following are several typical cases of fires in which certain points of technique were correctly observed:

1.—Fire caused by a stroke of lighting had involved

most of the roof of a one-story frame residence like an L. The location was on a side street, supplied by a 4-inch water main, with not enough water available for one standard fire stream. A section of 1¼-inch hose was connected to the nozzle of the first line laid. Two men took it to the roof, cut a hole in the roof of the wing not yet involved by the fire, carried it into the loft and drove the fire back from entering this wing from the loft to the wing that was involved. The second line of 2½-inch hose, with a ¾-inch nozzle tip, was carried to the roof of the involved wing, and as soon as the fire was knocked out a bit, a section of 1¼-inch hose was attached to this and the damaged area overhauled.

The point about this case is that a skillful use was made of the limited amount of water available. The small line first used permitted quick and flexible manipulation by a few men and was operated to prevent the extension of the fire, rather than to throw water where the most flame and smoke was visible.

2.—Fire caused by an electric iron had involved an interior room of a one-story, brick, tin-roofed building occupied by a clothes cleaning and pressing business. The building was so heavily charged with smoke that entrance was impossible, and partitions made it impracticable to hit the fire streams from front or rear doors or windows.

The truck company was sent to the roof. A hole was ripped in the tin, the wooden boarding under it was cut away, and the hanging ceiling was pushed down with pike poles. The consequent ventilation enabled pipe men to enter at once and get to the fire. They did not open their nozzle control until they could see the fire, which was quickly knocked down and overhauled, with fire and water damage confined to one room, instead of streams being thrown blindly into the smoke and the building being flooded.

3.—A chimney spark had started a fire on the shingle roof of a two-story frame residence. The blaze was over an area about 6 by 12 feet and was about to be a good fire. A line of 1¼-inch hose was taken to the roof, the main part of the fire was swept with several dashes of the stream, and then the blaze was overhauled by a fine spray from the controlling nozzle, which was barely opened for this. The truck company had placed canvas covers (tent halves) on top of the ceiling in the loft under the fire, and not a drop of water reached the plastering. It will be seen from the foregoing that the drill school may have a useful part in the training of even the smallest town or village fire department.

Chicago Centralizes Its Purchasing

As an excellent beginning in an administrative reorganization of the city government, Chicago has recently passed an ordinance establishing a Department of Central Purchasing. The ordinance is based on a study and report made by J. L. Jacobs & Co., of Chicago, for the Mayor's Advisory Commission. Russell Forbes, Director of the Municipal Administration Service and Secretary of the National Municipal League, assisted in the preparation of the report, as special consultant assigned by the National Association of Purchasing Agents. Valuable assistance was also rendered by Charlton Chute and John R. Whitehead, of the Chicago Purchasing Agents Association, Mr. Whitehead being chairman of the subcommittee on purchasing of the Mayor's Advisory Commission.

Although Chicago was one of the first cities of the United States to adopt the principle of centralized purchasing, for part of its needs, the idea has received very limited and imperfect application. As stated in the report: "No less than fourteen different offices now buy the supplies, materials and equipment used by the various departments, boards and commissions of the city of Chicago. These fourteen buying agencies spent in 1930 approximately $18,395,000. To carry on this work, at least fifty-one employees were engaged full time, twelve employees were engaged part time, and in addition the heads of the various departments, boards and commissions concerned devoted a portion of their time to supervision of purchases and contracts. . . .

"Many of these fourteen offices buy the same commodities at greatly different prices. Many commodities are also purchased in small quantities at practically retail prices. The purchasing procedure varies widely and in many respects is cumbersome and costly." Elsewhere in the report the system is described as extravagant and wasteful.

Salaries for all employees engaged in purchasing are stated to have totaled at least $140,000 in 1930, excluding many incidental items for stationery, overhead, etc.

The new system, as embodied in the ordinance, provides that the Department of Central Purchasing shall have charge of the purchase and contracting for supplies, materials and equipment and contractual services required for use by all departments, boards and agencies under the control of the City Council, and for any other department or board which voluntarily votes to participate.

The Department is made up of four bureaus: Standards and Specifications; Purchase and Contract; Inspection and Testing; and Stores. There is also set up a separate Board of Standardization, consisting of the Commissioners of Central Purchasing, Public Works, and Health, and the heads of any other operating departments who may be called into consultation regarding their specific requirements. This Board is to establish standards and specifications for the minimum number of qualities, sizes and grades of commodities needed for use by the city departments. It is to avail itself of the engineering and testing facilities in the various operating departments, and is to be assisted and supplemented by the Purchasing Department's Bureau of Standards and Specifications.

The Department of Central Purchasing can obtain estimates of future requirements of the operating departments, and consolidate these wherever possible, for quantity purchasing; it will make occasional inspections and tests of delivery to determine whether the city is receiving the commodities specified; it has general charge of the installation of a uniform system of accounting and stores control in the various stockrooms and storehouses of the city departments, can require periodic inventories of departmental stores, and has the power of transferring or salvaging any surplus materials or stock held by the city. The Department is to have no connection with or supervisory control over the awarding of public works or other construction contracts.

The new system of purchasing, as worked out in the report, embodies a modern, simplified purchasing procedure, designed to secure wide and free competition, and to assist in accounting control and the taking of discounts for prompt payment of invoices.

Fighting Snow, Slush and Sleet

Discussions of a Problem Which Confronts the Snow Belt Annually

Organization in Milwaukee, Wis.

By HENRY D. DOLGE
Assistant Superintendent, Bureau of Sanitation

The biggest thing in snow removal is the service. We get our plows started along about nine or ten o'clock in the evening, and the Department feels proud of its work when a newspaper says in the morning: "Well, I got in my car and drove downtown and the streets were clean." We are operating 46 plows attached to tractor-type Stehling trucks.

The city is divided into 31 districts. The downtown districts have two plows, and the outer districts one plow. The downtown district, which is about 2 square miles, is usually opened by the time the general public gets up in the morning.

The individual foremen of the different wards get busy after 6 o'clock in the morning and hire all the men they need with their regular men to clean crosswalks and remove the snow. With the tractors and trailers the snow is hauled down to the river. The mechanical loaders have not been used for two years, because of the feeling that hand loading should be used to give greater employment at the present time.

By this method, the Department has succeeded in getting the downtown district practically cleaned up the first day after any snowstorm. Seven or eight years ago, when 3 to 4 feet of snow fell it took a little longer.

In all business streets the snow is removed by dumping it into the river. No snow is removed from the residential section except by pushing it to the curb so that the street is open to traffic.

Very little support is received from the street-car companies. The tramway companies are very prompt during a snowstorm in getting out their sweepers, in order to keep their cars running, and if the snow is heavy enough, they also operate snow-plows. On first thought, this of course is a help to the traveling public, but to the abutting property along these track zones this ridge of snow and ice is a nuisance, and it has to be removed; in the latter case the tramway companies are very slow, for their main point is to keep their cars running. After this is accomplished, the banks of snow and ice remain on the side of the street and are removed by the city.

On all vacant property in Milwaukee, the city moves the snow from the sidewalks and assesses the charge to the property holders on their tax bills. For an average 30- or 40-foot lot, the cost is not more than $1.50 to $2.00 a season.

In handling sleet storms, when all types of pavement are covered with sheets of ice, we now have 400 sand boxes of 2-yard capacity located at busy intersections, in which we keep dry sand and a shovel. With the use of these handy facilities, we get lots of cooperation. All traffic men from the Police Department and the citizens themselves use this material when necessary, so it is nothing unusual for us to have dry sand placed on slippery intersections and arterial highways before the morning traffic begins. There is no doubt that this method prevents innumerable accidents and collisions, as well as a hazard to life and property. On a sleety morning the sand is so in demand that we often use 300 to 400 tons of it in one day.

Truck Snow-Plows and Loaders in Minneapolis, Minn.

By JAMES GARBERG
Superintendent of Streets

For snow fighting, Minneapolis has approximately 35 trucks equipped with plows. The method of attack is to send out these truck plows first on the primary streets, so that about four hours after each storm every primary street leading into the Loop district is plowed; then the patrol graders or big, heavy type tractor graders are sent out on the streets. The graders are run with the blades straight, to clean the snow right down to the pavement. Minneapolis even removes the snow between the car tracks. After that is done, all attention is centered on removal. Three mechanical loaders are owned by the city, but lately, because of unemployment, hand loading has been used.

All snow-removal equipment in Minneapolis is owned by a central equipment department. The snow-plowing or snow-removal department must pay to the Equipment Department a rental fee for each piece of equipment used. For instance, the rental fee for a 3½- to 5-ton truck runs from $2.25 to $2.75 per hour. Tractors equipped with plows cost $5 an hour. The labor rate in Minneapolis, that is, the common labor rate, is $5.50 per 8-hour day minimum. The mechanical wage is 95 cents an hour. The truck driver's wage scale runs from 75 to 80 cents an hour; a tractor operator receives $1 an hour. Because these unit wage rates and various weather conditions must be taken into account, it is very difficult to arrive at any kind of unit cost that is comparable with costs in many other cities.

In the Loop district where the loaders are used, a 10-horsepower tractor with a reversible plow is used to clear the sidewalks. The plow goes down the sidewalk, throwing the snow onto the street; this is followed with a 60-horsepower tractor with a straight blade, and attached to that is the grader. By this method there is not much snow left on the sidewalks for the business houses to remove.

Handling Big Snows in Toronto, Ont.

By HAROLD D. BRADLEY
Deputy Street Commissioner

In the winter of 1930-31 Toronto spent about $350,000 for the removal of snow, which provided considerable work for the unemployed. Snow removal is confined generally to the main arteries and car lines. When a storm occurs, the city forces work day and night continuously until the main arteries are cleared. The transit company operates several snow-plows and brooms as soon as the storm starts. We follow immediately with trucks and loading apparatus, including mechanical equipment. The snow

is disposed of by dumping into sewers and the bay and along the waterfront, as well as on certain low lands.

Contrary to belief, many Canadian cities do not have as much snow as some places in the United States. The maximum fall in the winter of 1930-31 was 9 inches, with a total fall of 54 inches from the first of January until the end of March. The work is handled entirely by the city. In a heavy storm, 2,000 men will be engaged, at a wage rate of $4.80 per day. The truck hire is about $4 an hour for a 5-ton truck.

Sleet Rather Than Snow the Problem in Indianapolis, Ind.

By **WILBUR H. WINSHIP**
Street Commissioner

Sleet and slush cause more anxiety than a fall of snow, because slick, icy pavements are very dangerous to autoists and pedestrians. To eliminate such conditions quickly and efficiently, we use a centrifugal farm or lime spreader, which may be obtained from any implement dealer at a very small cost.

This apparatus when attached to a truck forms the rear or end gate. Through sprocket gears and chain the driving power is taken off the rear truck wheels. A speed of 8 to 10 miles per hour should be maintained, and the sand and salt which is being fed into the hopper will be evenly distributed to a width of 30 to 40 feet. One truck with driver and helper to keep the hopper filled with material forms a crew.

When we are confronted with slush which does not freeze immediately, our street flushers are brought into service and the streets thoroughly washed.

Our forces are so organized that all emergencies are rapidly eliminated.

Snow Removal from Sidewalks in New Britain, Conn.

By **PHILIP A. MERIAN**
City Engineer

The problem of snow removal from sidewalks is a serious one in New Britain, for the city is faced every year with a number of claims for injuries sustained through falling on icy sidewalks.

The existing ordinance states that snow shall be removed by the property owner from the sidewalk in front of his property within six hours of daylight immediately following the cessation of a storm. There may be many hours of delay in clearing the walk within the limit set by the ordinance, and this generally results in a question of liability on the part of the owner as well as of the city. Daylight officially ends between 4:30 and 5:30 P.M. during the winter months, and should a storm end shortly after such a time it would set the limit for clearing of snow to 12 o'clock noon the following day, or nearly 18 hours of uncleared and dangerous sidewalk conditions.

Snow on city sidewalks generally causes slippery walking, for the snow is continually packed down by pedestrian traffic; in fact, it is difficult to distinguish freshly packed snow from ice which may have formed from melted snow. This condition is often the deciding factor in fixing the liability of the city, for if it can be proved that the ice was present before the storm, the liability of the city is generally admitted. It is readily understood that snow allowed to remain on a sidewalk for six or twelve hours will be virtually ice, and therefore difficult to prove other than existing ice.

Combating Icy Streets with Calcium Chloride in Rochester, N. Y.

By **EDWIN A. MILLER**
Supervisor of Maintenance, Department of Public Works

When ice forms on the streets of Rochester,—and that is not an infrequent occurrence,—calcium chloride is distributed with mechanical spreaders. This has proved to be an efficient means of preventing accidents. While accidents have been greatly reduced in Rochester, it is never going to be possible to educate people to drive carefully at all times, and just how to drive on slippery pavements. The taxpayers and the local automobile club have been very generous in their praise of the use of sand and calcium chloride as a means of breaking up the ice by melting it and furnishing good traction on all streets.

The mixture applied to the streets is about one shovelful of calcium chloride to five shovelfuls of sand. This is perhaps a little more expensive than the use of salt, but it is well worth the price when you are saving human lives.

In Rochester the street-railway company has to pay 50 per cent of the cost of snow removal on the streets where its lines operate, as required in their franchise. The company plows its own car lines, and the city forces follow immediately and plow back to the curb.

Calcium Chloride in the Cinders Protects Hillside Streets in Montclair, N. J.

By **A. P. HEYER**
Director of Public Works

Montclair, N. J., is all hillside, so that it is doubly necessary to maintain good traction on all the streets, for skidding would be disastrous. We use a mixture of calcium chloride and cinders on icy hillside streets in extremely cold weather. When there is no very cold weather in sight, we use the cinders alone. The cinders that are to be used with calcium chloride are kept in a dry place and are mixed at the city yard and sent out in trucks as needed. The cost has been no higher than that of using salt, and has been more satisfactory.

Cooperation Between Street Railway and City in Snow Removal

By **A. E. ROCHE**
Commissioner of Public Works, Troy, N. Y.

A complete understanding of the responsibility of snow removal in Troy, N. Y., has been reached between the street-railway company, the bus companies, and the city. The bus companies plow all the streets over which they operate, and entirely at their own expense. The local street-railway company, which in some instances is the owner of the bus company, matches the city equipment with its own snow-removal equipment in the commercial sections of the city. There is no monetary consideration, but the equipment is matched plow for plow and truck for truck, and the street-railway company employs about one man in this work for every two which are employed by the city. While there is no exchange of money, there is an equal volume of service rendered. The street-railway company occupies about 45 per cent of our street width and renders about 50 per cent of the service.

Fighting Your City Traffic Accidents with Legislation and Enforcement

The Second of a Series of Three Articles Suggesting a City Program to Win the National Traffic Safety Contest

By SIDNEY J. WILLIAMS
Director, Public Safety Division,
National Safety Council

THE National Traffic Safety Contest for 1932—in which, at the time of this writing, more than one-half of all the larger American cities and several scores of smaller cities have already been entered—is causing many cities to re-examine their records in traffic accidents and to re-organize their traffic safety programs.

There are already well over 200 cities enrolled from all over the United States, and it is probable that at least one-fourth of the total population of the United States will come directly under its influence. The first 100 cities to enter (which did not include either New York or Philadelphia) represented a combined population of about 20,000,000. State-wide organizations have been at work to encourage as many as possible of their municipalities to enter; and at this time the states with most cities entered are Massachusetts, Michigan and Arkansas. These and other states will compete for the state-wide safety award. So great has been the interest by cities of from 1,000 to 10,000 population, that a seventh population group has been created in addition to the former groups for which "Safest City" awards were offered. Many city newspapers are giving much editorial space, and national, state and city organizations are actively supporting the contest.

All of this proves that many different cities are ambitious to win in their respective population groups the award of the "Safest City." These cities are determined to do all that they can to curb their traffic accidents, and thus to save human lives, lessen property damage, relieve traffic congestion, and arouse a new community interest in traffic safety.

Perhaps it would be well, as a first step for a city which is ambitious to win this award, to ask itself these questions: What kind of city traffic laws have we? and What is the attitude of our city officials, our motor-vehicle drivers and our citizens in general toward the enforcement of these laws?

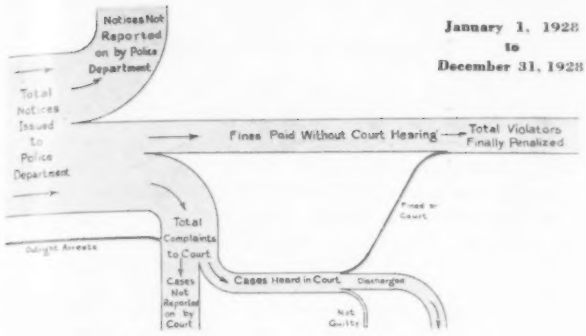
A trained observer usually can tell, very soon after his arrival in a city, whether that city is making a good or a poor traffic safety record. He will base his opinion on two observations: first, the city engineering facilities, such as traffic signs and lights and improvements, for the convenience and control of the traffic flow; second, the habits of pedestrians and motor-vehicle drivers toward the observance of traffic regulations. Thus it may be said that every city has developed a distinct attitude, or "personality," toward its traffic laws. If the city is progressive, it will have developed many or all of the traffic engineering facilities described in the first article of this series in the January issue of THE AMERICAN CITY.

City Traffic Engineers

Although comparatively a new development, an increasing number of cities have traffic engineers. These include Leslie J. Sorenson, in Chicago, where the outstanding accomplishments of the past few years have been the installation of traffic signal systems in the Loop and elsewhere and the in-

EVIDENCES OF RECKLESS DRIVING

This car collided with another, the driver of which had to be taken to the hospital. Witnesses could not agree in placing the blame. The police officers therefore called the accident investigation squad. The print of the other automobile's headlight shown on the car door and the telltale skidmarks (right) led to the arrest of the man in the hospital


Notices Not Reported on by Police Department
Total Notices Issued to Police Department
January 1, 1928 to December 31, 1928
Fines Paid Without Court Hearing
Total Violators Finally Penalized
Total Complaints to Court
Cases Not Reported on by Court
Cases Heard in Court
Discharged
Not Guilty
Fined by Court

LARGE CITY IN MIDDLE ATLANTIC STATES

A weak system for handling traffic violators. This city has a special traffic court and the equivalent of a plead-guilty-and-pay-fine traffic violations bureau. Nearly half of the total notice forms issued to the police department are never reported on by them. Of the remainder, about a third pay in the traffic violations bureau, but two-thirds are left for the court. Of these court cases, only about a third are ever heard

stallation of restricted parking. In Philadelphia, Burton W. Marsh has supervised a continued traffic survey, and preparations are being made for a new signal system. In Pittsburgh, Lewis W. MacIntyre supervises an important division of traffic control which includes extensive improvements and maintenance expenditures. In Washington, W. A. Van Duzer has made extensive use of accident records, and for a number of years the city has maintained a consistent low record in traffic accident fatalities. In St. Louis, Charles G. Gonter, who succeeded Reyburn Hoffman, has supervised extensive improvements in signals, restricted parking and other street traffic control. In Seattle, J. W. Bollong has supervised continuous traffic engineering improvements. Los Angeles, with R. T. Dorsey as traffic engineer, recently established a progressive traffic survey and a pedestrian regulation system. In Boston, John F. Hurley has been following through a detailed traffic survey. In Flint, Mich., Oscar E. Gunderson has been carrying forward traffic control improvements.

There are few other cities which have a full-time traffic engineer, and some which are carrying forward traffic improvement programs through their city engineers. Among these are J. C. Vincent in Minneapolis; Ralph W. Eaton in Providence, R. I.; P. L. Brockway in Wichita, Kans.; E. Clinton Webber in Reading, Pa.; F. S. Parkhurst in Olean, N. Y.; and C. P. Wells in Great Falls, Mont.

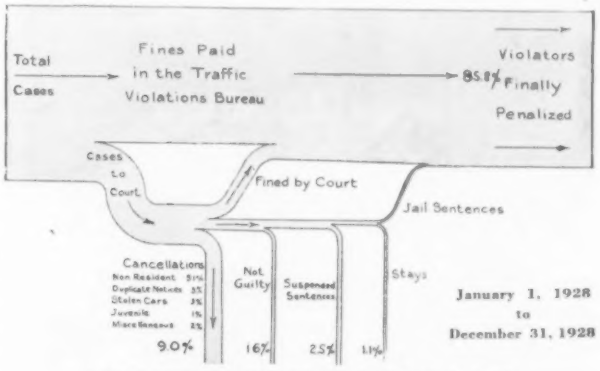
Traffic engineering facilities, to be utilized to their greatest value, must be supplemented by a well-rounded community program of traffic legislation and enforcement. The points on which awards will be made in the National Traffic Safety Contest include a maximum of 15 points on "traffic law enforcement." These points will be awarded for "conformance with Model Municipal Traffic Ordinance, proper organization of traffic police forces, accident investigations, traffic courts or sessions, traffic violations bureau, number of arrests and summonses and convictions."

It has been said many times that "good public observance of traffic rules is the *surest way* to bring down traffic fatalities." In the "Suggestions to Cities Entered in the National Traffic Safety Contest" issued by the National Safety Council it is stated that "the spearhead of accident prevention is proper enforcement. The vigorous enforcement of traffic laws will reduce accidents more promptly and surely than any other one activity."

During one of the sessions of the Traffic School of the recent Annual Safety Congress, Charles Greenwood, Inspector of Traffic of Toronto, after describing the activities of a force of more than 100 traffic officers under his supervision, made this statement: "The traffic problem is the greatest problem that any police department in any city has to face today. Some cities have a big criminal docket, but no matter where you go, you will find that deaths by automobile are more numerous than those by gun or other criminal means." In support of this statement, investigation for the United States shows that there are about three times as many motor-vehicle deaths annually as homicides. For example, there were in the United States for 1930 about 11,000 homicides and 33,000 motor-vehicle fatalities.

Adopt the Model Municipal Traffic Ordinance

A very convenient and practical test of the "modernness" of your city traffic ordinances is to compare them with the Model Municipal Traffic Ordinance adopted by the National Conference on Street and Highway Safety, after formulation by a large committee of traffic authorities. More than 100 cities of the United States already have adopted this ordinance either completely or in large part, assuming slight modifica-



LARGE CITY IN WEST NORTH CENTRAL STATES

Very effective handling of traffic violations cases. This city has a traffic violations bureau of the plead-guilty-and-pay-fine type attached to a special traffic court. The police department accounts for all notice forms issued to them. Almost all of the violators are ultimately penalized, and the remainder are all strictly accounted for. Few warrants do not result in the arrest of the violator. This shows conclusively what can be done by businesslike methods

tion to conform with state laws, and purely local adaptations to include local streets and local descriptions. In considering the adoption of this ordinance, the city should not make the mistake of trying to be "original," since even slight changes in the wording may so destroy the unity and the total meaning of the ordinance as greatly to modify its value. If all cities would conform, through the uniform adoption of this Model Municipal Traffic Ordinance, it would represent a marked advance in traffic regulations for the entire nation.

Of course, such questions as parking regulations and through streets are purely local problems which deserve most careful consideration. There may be said to be a general tendency toward increased parking restrictions and reduction of parking time. In the matter of through streets, many cities doubtless have made the mistake of designating through streets without sufficient preliminary investigations and without sufficient previous public education.

Special Training for City Traffic Police

One of the most important recent developments in city traffic control has been the special training of police departments in traffic activities. This was one of the chief subjects of discussion at the most recent Annual Safety Congress.

The problem of the necessary regulation of automobiles has grown so rapidly in most cities and has come to represent

such a large part of city police duties that this branch of police service as a rule is undermanned. Investigations about two years ago by the National Safety Council among American cities indicated that the complete traffic forces of cities averaged about three full-time men per 10,000 population, and this investigation seemed to show that such a distribution possibly was sufficient for small and intermediate cities but perhaps not sufficient for large cities.

Because this work is highly specialized and very vital to the welfare of the city, city traffic police should have special training. A number of cities and some states have training schools. As examples, the League of Kansas Municipalities held such a school for twenty-four Kansas cities some months ago in Wichita. A like school for Illinois has been conducted by Northwestern University at Evanston. Washington, D. C., has a training course of three months for all members of the department. In Milwaukee, traffic men have a certain day of the week to attend training schools.

Philadelphia recently established a training school for traffic men, and the traffic engineer of that city hopes soon to have an accident investigation squad. Rochester has junior traffic policemen—boys and girls who are selected through civil service examinations, trained in the protection of school children, and rewarded with seals and certificates and other honors. There was recently published, through the cooperation of the Albert Russel Erskine Bureau for Street Traffic Research of Harvard University and the National Safety Council, the first comprehensive "Traffic Officer's Training Manual," by Clarence P. Taylor, formerly engaged in traffic work for the Berkeley, Calif., Police Department and now Traffic Engineer of Massachusetts.

All Traffic Accidents Are Important

In former days it was generally assumed that a traffic accident was something that could not be helped—that no one was at fault. Thus the violation usually was not recognized excepting in case of a serious or a costly accident. But gradually there has developed the point of view that most accidents are preventable, and that to carry out a consistent prevention program, minor accidents as well as serious ones must be recognized and followed up. Pioneer work in this field was carried out in Cleveland and Detroit some years ago, and the plan was further developed in Evanston, Milwaukee and other places.

It is assumed in this program that a traffic accident is a definite symptom of something wrong, and the facts of the accident should be expertly assembled and used. Under this plan a number of cities are training and equipping traffic investigation squads to go to the scene of important accidents and make thorough investigations. The usual equipment is a light automobile, a first aid kit, portfolio with all necessary forms, electric flashlights for night work, a tape measure for measuring skid marks and developing an accident diagram, a camera and tripod and flash powder for night pictures, and a portable typewriter. In some cities the car is equipped with a radio receiving set and it probably will have a cruising schedule during certain hours of the day and within a district where accidents are most likely to occur.

Securing Convictions

The work of accident prevention squads with the Evanston Police Department has been highly successful in securing convictions. At least fifteen other American cities investigate traffic accidents to aid in the conviction of traffic law violators. For 1930 in Evanston, 75.37 per cent of cases secured conviction. In St. Paul, Superintendent of Traffic Harry N. Wettergren estimates that 15 per cent more traffic violators were convicted through presentation of pictures, skid-mark measurements, and signed statements of witnesses, than were made possible through accident investigation squads. Other cities where this method has been successful are Minneapolis, Lynn, Mass., Dayton, Ohio, Jackson, Mich., St. Louis, Cleveland, and Detroit.

There has been a marked tendency among cities to develop specialized courts for the hearing of traffic cases. San Antonio and Great Falls are examples of such specialized courts which have developed added community respect for traffic law observance and have improved the community safety record. Boston and Minneapolis also afford examples of specialized traffic courts where community support has developed so far that there are relatively few arrests and a high percentage of convictions. Many cities now have such courts, and when properly organized and conducted without political interference, there have been pronounced results in increased arrests, a larger percentage of convictions, and reduction of accidents.

Another important development has been traffic violations bureaus, probably under court supervision, though sometimes under supervision of police departments. These bureaus are maintained to relieve the court of a certain percentage of minor violations and for the convenience of minor violators who are willing to acknowledge their guilt and pay a small fine without the necessity of formal court procedure. It has been demonstrated through the experience of Judge Levi M. Hill in Minneapolis, and in other places, that in a special traffic court well organized and administered, supplemented by a traffic violations bureau, traffic violators are willing to plead guilty on less important cases and pay their fine without being brought into court. Such bureaus when well conducted have resulted in stimulating a more wholesome community respect for observance of traffic ordinances. An essential feature of such a bureau is that all summonses be properly recorded and the work summarized in public reports at periodic times.

A special investigation in the field of traffic courts and traffic violations bureaus among about 150 cities by the National Safety Council resulted in the publication of "Traffic Courts and Violations Bureaus," in which some of the following facts were determined.

It was found that the new traffic problem has dropped so much new and specialized work on courts that the formation of specialized courts is advisable to insure greater uniformity in handling cases, to relieve congestion, to give proper attention to minor cases. This investigation indicated that 50 to 90 per cent of all traffic law violators if given the opportunity will acknowledge their guilt and pay fines without the formality of a hearing in court. It is assumed that nearly every city of more than 20,000 population has a sufficient traffic enforcement problem to justify a specialized traffic court. It was demonstrated as a principle that "the successful administration of traffic courts and traffic violations bureaus should be safeguarded by the maintenance of adequate records regarding the disposition of all traffic cases for official and public information and by a strict accounting system for all summonses."

It is highly important that the city which is ambitious to win the National Traffic Safety Contest should give attention to a proper traffic ordinance and to the development of enforcement machinery and public good-will that will tend in an increasing degree to prove this support through law observance.

The price of safety on the streets and highways is a trained and disciplined population, comparable to that of a well-managed industrial plant, and the denial of personal liberty where it interferes with the safety and convenience of the group.

—From an address by Carl W. Bergquist, President, National Safety Council.

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz, P. J. Stupka

Washington's Three-Movement Traffic Signal Control

TRAFFIC-ACTUATED signals operating by a three-movement system have recently been installed at the intersection of Wisconsin and Massachusetts Avenues, one of the heaviest and most complex boulevard crossings of the National Capitol.

Decision to install the time extension demand type was reached by Washington traffic officials after a traffic survey and count revealed that a total of over 2,400 vehicles passed through the intersection during the peak hours, from 8 to 9 a. m. and 4:30 to 5:30 p. m., and that approximately one-fourth of these vehicles made a left turn down bound from Wisconsin Avenue in the morning, and the same number turned right in the evening from Massachusetts Avenue, maintaining proportionately heavy movements on the same turns throughout most of the day. By introducing the three-phase time operation with time extension detectors, these two unusually heavy turns are permitted in the same phase without interference with other groups of vehicles.

The three major movements may be classified in general as:

(1) Straight through down bound on Wisconsin Avenue, left turn down bound on Wisconsin, and right turn up bound on Massachusetts Avenue.

(2) Through traffic both ways on Massachusetts Avenue.

(3) Through traffic both ways on Wisconsin Avenue with left turn down bound waiting in center lane.

The few usual left and right turns are of course permitted on the straight through movements. The green or "Go" remains on the phase last used.

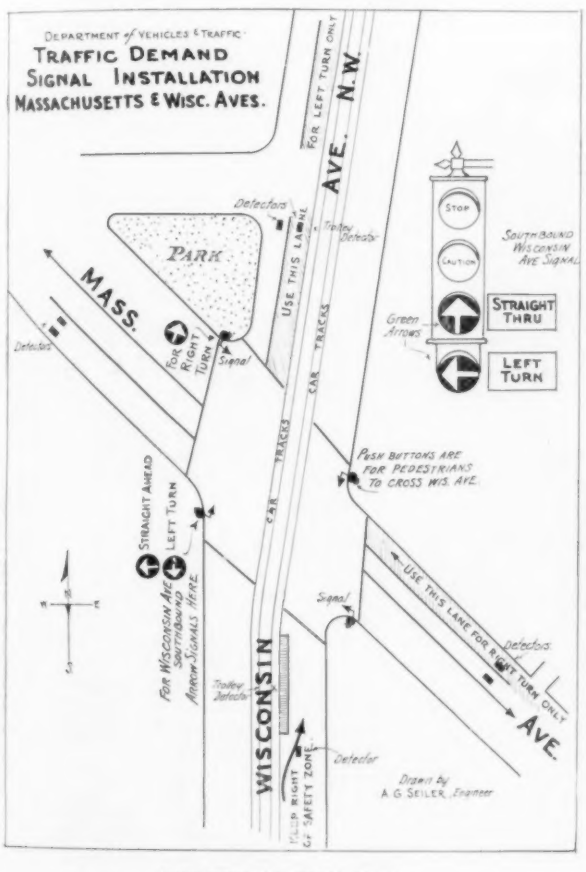
At the northwest and southwest corners it was necessary to attach an additional standard green arrow unit at the bottom of each three-light single-face signal, the first being for the right turn up bound on Massachusetts Avenue, while the other signal carries a left turn arrow for down bound traffic on Wisconsin Avenue, and instead of using the plain green lens for through traffic there has been substituted a green arrow pointing upward, as is shown in the illustrations.

Seven vehicle detectors and two trolley detectors were required for the installation. Four push-buttons connected in series to the proper detectors for actuation by pedestrians desiring to cross Wisconsin Avenue were installed on the signal posts.

Before placing the system in operation, it was necessary to carefully lane the approaches to the intersection for preventing conflicts and at the same time insure direction of the vehicles over proper detectors. White letters five feet high were painted in the lanes designating "for left turn" or "for right turn." Large arrows were also painted to divert traffic away from the car tracks toward the detectors.

The system has been operating since the first part of October, 1931, and has proved effective in overcoming the complicated and rather dangerous condition which formerly prevailed at this important intersection.

W. A. VAN DUZER,
Director of Vehicles and Traffic, District of Columbia.



THE INSTALLATION PLAN
Traffic demand signals in operation at the intersection of Massachusetts and Wisconsin Avenues

Photographs from Miller Train Control Corporation

THE SIGNALS IN OPERATION
The lower photograph shows the third of the major movements listed in the accompanying article

WILSHIRE BOULEVARD

Not only does the flexible progressive system effectively handle traffic on one of the world's most heavily traveled highways, but, in addition, the signal and control units harmonize with the attractive street-lighting standards and the beautiful bit of architecture in the background

Heavy-Traffic Stream Controlled by Flexible Progressive System

LOS ANGELES, CALIF.—This municipality—with more automobiles in proportion to its population than any other city—has recently placed in operation its new traffic signal installation controlling a five-mile stretch on its most prominent artery of travel.

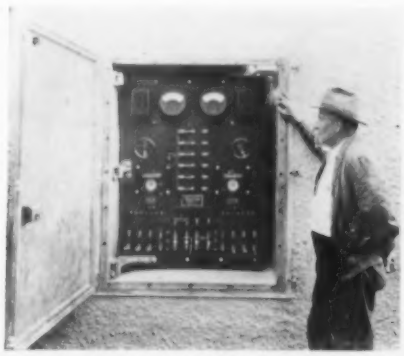
The contract, as awarded to the Eagle Signal Corporation, called for what is commonly known as the flexible progressive system, with "co-ordiplex" controllers. A master control station is located in a subway at about the middle point of the Boulevard. From this station the cycle length of the system can be instantly varied over a very wide range, the signals may be thrown to all-red as an emergency feature, and certain selected signals may be caused to flash amber at night while others remain in normal operation. The all-red feature may be controlled at any one intersection independently of the others, by an officer at that intersection, through the ordinary manipulation of the hand control.

The numerous advantages of the flexible progressive system demonstrate themselves to an exceptional extent on this new installation. Where formerly traffic signals which were not coordinated were in use and caused drivers to stop unnecessarily and at the same time encouraged them to rush for green lights when they finally could see a green light ahead, now the lights are timed so that a driver can maintain a speed of 25 miles an hour, and if he deviates far from this speed, he is quickly discouraged from continuing to do so by being obstructed by red lights. Not only does the system discourage high speeds, but it likewise discourages unreasonably low speeds.

The Los Angeles Traffic Association and the Wilshire Boulevard Association, as well as other interested groups which had studied the problem, were determined to have the finest system, as regards appearance as well as flexibility, yet known to the art. To this end, their specifications called for cast bronze signals and control cabinets. Likewise, they called for pedestals to match the very attractive lighting standards which were in use on Wilshire Boulevard. The result is that the traffic signals add to the appearance of the Boulevard instead of detracting from it.

A poll of motorists traveling Wilshire Boulevard was recently taken, and the sentiment expressed in the replies received was to the effect that the system was a great aid to traffic and that it should be extended to other streets of the city.

WALTER LINDERSMITH,
Secretary, Los Angeles Traffic Association.



MASTER CONTROL STATION

From this station, located in a subway at the middle point of the Boulevard, the cycle length of the entire system can be instantly varied over a wide range

25 MILES AN HOUR, CONSTANT FLOW

This is in decided contrast to the former traffic condition on Wilshire Boulevard which allowed breakneck speed between main intersections followed by waits for cross traffic

Annual Automobile Deaths Decrease for First Time

THE motor death rate for each 100,000 of the population of the United States decreased from 26.6 in 1930 to 26.4 in 1931, the first annual per capita decrease to be recorded in the history of the automobile, according to a release which has been made public within the past week by the National Safety Council. The depression and fewer cars on the highways are given as probable factors, though safety education carried on by the Council has played an important part.

Statistics for the year have not been completed, but little variation from the present estimate is expected. It is based on the mortality returns, mostly for eleven months, from thirty-six states which together have a total population of 104,000,000.

There were, it was estimated, 33,000 deaths in motor accidents in 1931, as compared with 32,750 in 1930, but when this is adjusted for the increase in population the foreging figures result. The 1930 death total was an all-time high for per capita fatalities.

A decrease in automobile license registrations, which amounted to 2.6 per cent for passenger cars during the last year, was reflected in a higher proportion of deaths in ratio to the total number of automobiles registered. Deaths to each 100,000 cars registered were 127.2 in 1931 and 123.5 in 1930.

In proportion to the mileage of vehicles in use, as reflected in gasoline sales, the mortality rate decreased. Deaths per 10,000,000 gallons of gasoline consumed fell from 20.8 in 1930 to 20.3 in 1931.

Another factor for a lower death rate, for which the Council gives the depression credit, is the increased ratio of commercial vehicles in use during 1931 as compared with the privately owned and driven machines. Truck registrations increased .3 per cent during the year, as compared with the 2.6 decrease in passenger car registrations, and the professional drivers of these commercial vehicles are, in general, more careful and responsible for fewer accidents than is the case with the drivers of passenger automobiles.

Safety Zone Design

AN article in the December, 1931, AERA on safety zones, by Hawley S. Simpson, reports on the results of a nation-wide safety zone survey made under the auspices of the American Electric Railway Association. Only safety zones offering more substantial protection to the pedestrian than do painted lines and/or "mushroom" buttons were considered. Zones of the types included in the survey were found to be in use in all cities of more than 500,000 population and in 32 cities of between 100,000 and 500,000 population, as well as in a number of smaller cities. The total number of protected safety zones was approximately 3,500.

A wide variety of types of zones was found to exist, although the author believes that greater uniformity in the design of some of the construction details would be in the interest of safety. The most important items are believed to be the lighting and the end abutments. Lights should be of such a character as to give the highest practicable degree of visibility, since night accidents at safety zones were found to be most frequent. The abutment should be so constructed as to minimize the effect of collisions, should they occur.

On the more recently installed zones, lights serving four distinct purposes are used. These are:

1. Lights showing to approaching traffic, mounted 9 to 12 feet above the pavement.

2. Lights showing to approaching traffic, mounted from 3 to 5 feet above the pavement level.

3. Lights mounted so as to floodlight the approach end of the safety zone.

4. Lights floodlighting the area in which pedestrians stand.

Figure 1, which shows a safety zone on University Avenue in St. Paul, well illustrates the use of all four types of lights. J. C. Vincent, Traffic Engineer of Minneapolis, states that collisions with safety zones lighted as shown are practically negligible. Undoubtedly the floodlights of from 500 to 1,000 watts, shown by the arrow in the cut, are an important factor in accomplishing this. The floodlight illuminates the entire approach end of the zone. As an additional aid to visibility, the base of the signal is painted alternately black and white as recommended in the Manual on Street Traffic Signs, Signals and Markings of the National Conference on Street and Highway Safety.

Figure 2 shows one of the five safety zones recently constructed in Kansas City, Mo. These are the first to be built by the city under a $200,000 ten-year traffic program, of which $80,000 is allocated to safety zones, $70,000 to pedestrian underpasses, and $50,000 to street name signs.

The zones have a specially designed abutment intended to deflect or stop colliding motor vehicles without severe damage. The concrete "prow" is built in what would normally be a "dead" area. Each zone is to be lighted by a 250-candlepower floodlight mounted on a 15-foot standard. On the side toward approaching traffic will be a warning light mounted at a level above the tops of automobiles.

The safety zones are being installed under the direction of M. F. Murray, Director of Public Works, assisted by Thomas J. Seburn, City Traffic Engineer, and an Associate Member of the Institute.

FIGURE 1
A safety zone, University Avenue, St. Paul

New Safety Official in Rochester

LEON R. BROWN, of the New York State Railways, Rochester Lines, has been chosen President of the Rochester Safety Council for 1932. Mr. Brown is a graduate of Cornell University, College of Civil Engineering, '11.

He has served on the Executive Committee of the Rochester Safety Council, and since 1925 has been Chairman of the Traffic Committee of the Rochester Engineering Society.

In addition to membership in the Institute of Traffic Engineers, Mr. Brown is a member of the Licensed Professional Engineers of New York State, the American Society of Civil Engineers and the American Society of Safety Engineers.

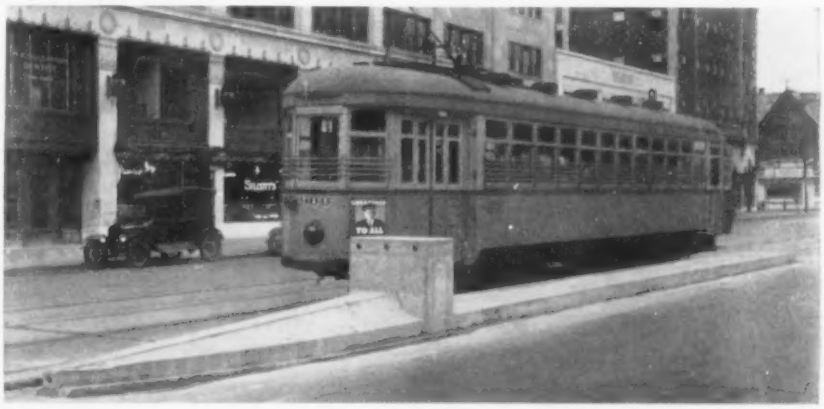


FIGURE 2
One of the five safety zones recently constructed in Kansas City, Mo.

Institute Library

TO establish a central clearing-house for street traffic information, the Institute of Traffic Engineers has commenced the collection of traffic reports, city planning reports, and similar documents. Much useful material has already been secured by the Research Committee, and one member, upon his own initiative, has contributed several valuable publications.

Additional material will be welcomed from members. The entire library will be available for use of members upon request. This service should be very helpful to cities when faced with problems upon which the experience of other municipalities may be of value.

"Planning Highways and Street Intersections for Modern Traffic Needs," by Burton W. Marsh, and "Methods of Studying Traffic Control Problems," by Dwight McCracken, two valuable articles from the 1931 *Municipal Index, are still available in reprint form at* 25 *cents each from* THE AMERICAN CITY.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

PROPOSED PARKING AREA
and the buildings which immediately surround it

Yonkers Planning Commission Recommends Municipal Parking Space

YONKERS, N. Y.—Studies undertaken by the Yonkers Planning Commission indicated that retail business in the center of the city is badly handicapped by lack of adequate parking space. Many people do not come to shop in the center of Yonkers, because it is difficult to find a place to leave their cars.

The most desirable location for a car park was found to be the interior of a large block immediately adjacent to Getty Square, the focal point of the business district. In its Progress Report for 1931, the Planning Commission has recommended that this area be acquired by the city and developed as a municipal parking space, with an area of about four acres. A large part of this plot, known locally as "Chicken Island," is unoccupied and the rest is improved with dilapidated or obsolescent buildings, as is indicated in the illustration. The 1931 assessed valuation of land and buildings was $768,800.

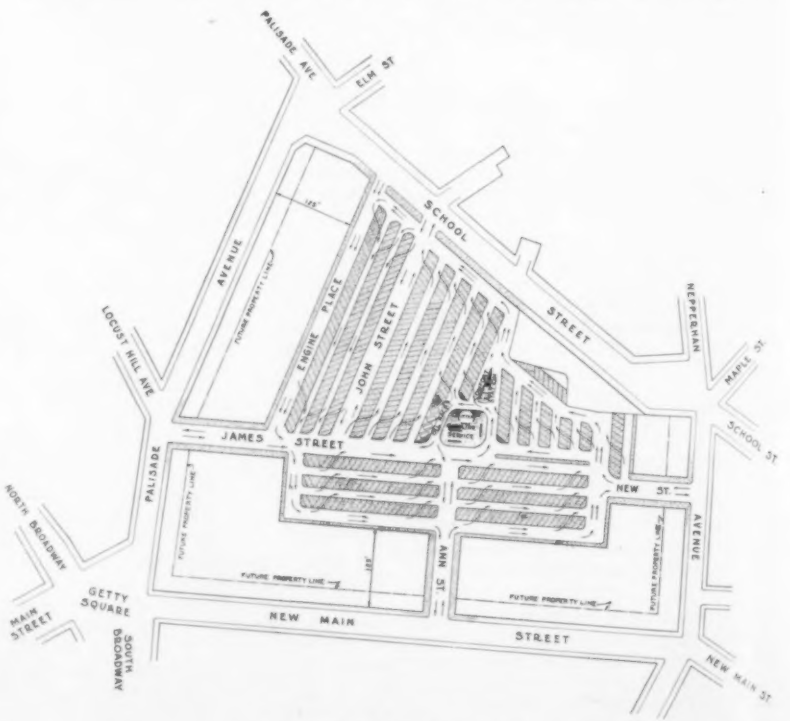
The location of the site is such that automobiles bound for the main business district from the north, east and south would be able to enter and leave the parking space without traversing Getty Square and the streets that converge upon it. Street congestion would thus be markedly reduced. Shops in the same block as the parking space could have back doors and rear show windows facing the access driveways, thus attracting the patronage of people who come by automobile to shop.

The recommended layout is based on maximum ease for parking cars and driving them away, with virtually all the 400 spaces arranged for direct pull through. It includes a central service plaza for the sale of gasoline, for automobile greasing and light repairs. In the future, part of the land could be used for municipal buildings, and the reduction in parking space compensated by the erection of a multi-story municipal garage.

As most of the benefit of the parking space would be local to the downtown district, the Planning Commission believes that 80 per cent of the cost should be financed by local assessments on land, and only 20 per cent by a city-wide bond issue. Zones of influence were laid out at 100-foot intervals from an entrance to the parking space, the distances being measured along the routes that people would normally follow when walking. The proposed scheme of assessment is so arranged as to make the percentage of the assessment inversely proportional to the distance from the parking space. Conferences with local business men indicated that the anticipated increase in value of the affected property would be about 20 per cent, which is equivalent to ten times the amount to be financed by city-wide bonds. As a municipality in New York State may borrow up to 10 per cent of its assessed valuation, the improvement would thus create borrowing capacity equal to that withdrawn.

Study of the assessed valuation and tax budget revealed that the anticipated increase in property values would make it possible to obtain the same tax levy as at present with a lower tax rate, despite the added interest requirements. In this calculation no allowance was made for profit on operation, although it is recommended that moderate charges be made for the parking of cars.

City ownership of the parking site would greatly facilitate the future widening of the boundary streets, for the abutting owners could be given 25 feet at the rear of their properties in exchange for 25 feet at the front. In this way they would have the same depth of lot as at present, but fronting on a wider street.



THE RECOMMENDED LAYOUT

Colonel A. Pearson Hoover is Chairman of the Planning Commission, and the other members in 1931 were Robert H. Neville, Jacob Williamson, City Engineer Christopher J. Sheridan, and Corporation Counsel Harry J. Laragh.

T. T. McCROSKY,
Planning Director.

Elkhorn Achieves New Municipal Building

ELKHORN, WIS.—The new Elkhorn municipal building, dreamed of by the citizens for years, has now become a reality of which the community is justly proud. The administration took advantage of a buyers' market and, without sparing expense in the construction of what is considered one of the best buildings of its class in the state, did this at an actual outlay of only $73,000. This was in addition to the site, which cost $20,000.

The three-story building is of Bedford stone and yellow face brick. The trim is of pale green with an additional touch of color in the coral awnings. On the ground floor is the council chamber, and opening from it are offices of the mayor and city attorney. Facing it across the main lobby, which opens from the west, are offices for the treasurer, city clerk, city engineer, and street commissioner. There is a separate office for the chief of police.

The offices of the light and water commission, reached by an independent entrance on the north, occupy the most prominent part of the building and include a 32 by 36-foot electrical appliance display room on the main floor, with a display room for heavy apparatus on the floor below. Just at the rear of these rooms and facing South Broad Street to the west are the fire department headquarters. The three-stall truck space is entered by 10-foot lift doors. Installed in this room is the telephone signal system, whereby a ring from the central telephone office sets off the electric siren mounted on top of the municipal building. A row of coat hooks and a novel arrangement for drying hose complete the equipment of the place. A wide stairway leads from the fire department to the basement quarters for the members of the department. Here has been provided a double shower bath of tile. A 16 by 44-foot club room has been provided and equipped.

Rest rooms for men and for women open off the main lobby of the building, from which a broad stairway leads to the second floor. Here is a large auditorium with a stage and dressing rooms, also a well-equipped kitchen and a ladies' lounge. The American Legion occupies the third floor.

The furnishings and fittings of the building are in every way appropriate. Edward Tough, of Madison, was the architect.

E. T. RIDGEWAY,
Mayor.

EXTERIOR

The Elkhorn municipal building, pleasantly modern in design

FIRE DEPARTMENT ENTRANCE

Showing the motorized equipment

Closer Control of Firearms

ERIE, PA.—We have a gun law in the state of Pennsylvania, which was passed at the last session of the Legislature, similar to the one in Providence, R. I., described in THE AMERICAN CITY for January (page 119). There is also such a law in the state of New York. The passage of the law against firearms was a move in the right direction, but in the majority of the states it is as easy to buy a gun as it is to purchase a cigar. Just pay the price, and no questions asked. If you are a professional criminal, you can purchase your revolver or machine gun the same as if you were engaged in a lawful and legitimate business. There is nothing to prevent you from taking guns into other states to carry on gang wars and other criminal acts at the point of a weapon.

The Fraternal Ordor of Police is absolutely in favor of drastic and uniform laws by Congress which would control the manufacture, sale, and distribution of firearms and other deadly weapons, by Federal statutes. We believe this is the only way you can get legislation for control of the pistol and regulate the complicated interstate aspect of traffic in guns. A bill of this nature was presented to Congress some five years ago, but it died in committee, for there was no one to lobby for it. Through such a law no one would be allowed to handle guns or issue guns but the police authorities in their municipalities or communities, through the Federal authorities. If this were the case, crimes would be cut 80 per cent—such as murders, bank robberies, hold-ups, homicides, suicides, and other crimes committed at the point of a gun.

Why all the gun display? There is no war going on in the country. We feel that all the law and order forces in the country should get back of an anti-gun bill, so that it would be impossible for the criminally inclined to purchase a gun; thereby the highways and byways would be made safe for law-abiding citizens, and protection of life and property would be secured.

The Fraternal Order of Police is pleased to know that THE AMERICAN CITY is taking an interest in the movement to curb the sale of firearms throughout the country. We are willing to cooperate in any movement, whatever it may be, that will curb the criminal.

E. J. ALLEN,
Grand President, Fraternal Order of Police.

Utilizing the Remnant at an Irregular Intersection

ST. PAUL, MINN.—Seventh Street, in this city, is eleven miles long and is a high-value retail street. It is being widened to the east and to the west of the business center for a 56-foot roadway with 15-foot sidewalks. Through the business center, however, the roadway is by-passed, the widening being done on Eighth Street, where property values are

EFFECTIVENESS AND ECONOMY IN LAND USE IN ST. PAUL

only from 25 to 40 per cent of the values on Seventh Street. Sibley Street was selected as the cross-over from Seventh Street to Eighth Street, property being taken to create a reversed curve.

Eighth Street, because of this reversed curve, had a triangular remnant about 68 feet by 35 feet, facing Eighth Street. This was condemned and taken by the city.

A German florist whose property adjoined the triangle took a lease from the city and is making use of this land for landscape advertising. He has created here a typical Dutch garden, which has proved very attractive to many people, especially children.

G. H. HERROLD,
City Plan Engineer.

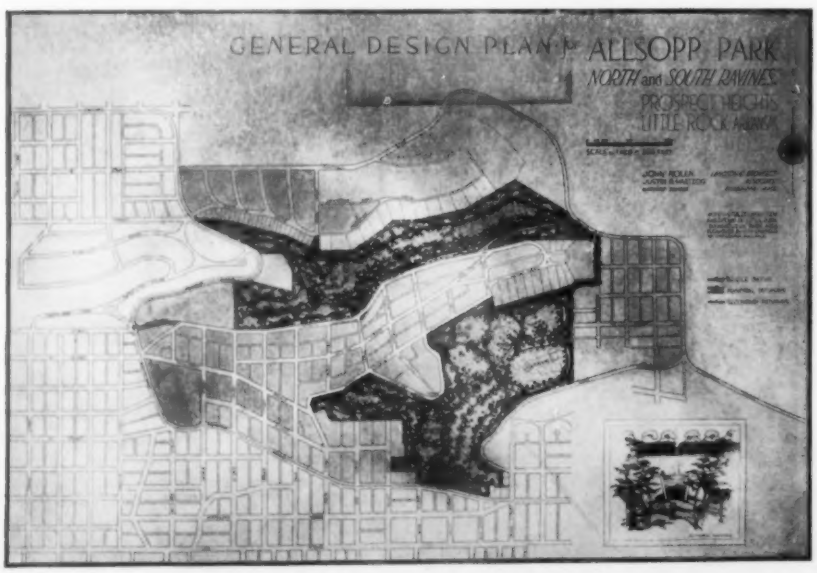
Unemployment Relief Work Creates Permanent Improvement

LITTLE ROCK, ARK.—This city, the capital of the state, through the generosity of Fred Allsopp, manager of the *Arkansas Gazette*, has been presented with a plan for the general development of two large naturalistic ravines in the northwest section of the city, known as Pulaski Heights. Mr. Allsopp, in making his gift to the city, was motivated by two aims: first, to assist in the provision of appropriate means of reducing the unemployment of the community; and, second, to provide a long-time coordinated scheme for the park development.

The land for the ravine parks (140 acres) was acquired as a result of the general plans made in 1913 for the development of a park system for the city of Little Rock, in the office of John Nolen, and consists of two ravines separated by a ridge developed as residential property. The ravines are of varied topography and filled with trees and dense undergrowth. It is proposed that all development be carried on to preserve the existing natural character. At suitable places through the park such features are introduced as, a small theater, a flower garden, tennis courts, playgrounds and similar recreational facilities. These features are designed for natural topographical sites and linked up with the exterior streets and the circulation system of the park, which consists of pathways, trails and bridle-paths. The connection to be introduced between the two ravines at the base of the ridge will make the park approximately a mile and a half long and varying from 500 feet to 1,300 feet in width.

The development of the park as an immediate unemployment activity is of particular merit and at the same time of great advantage to the city because of the return which will be made ultimately upon the investment of the taxpayers money. The cost of the work will be borne by the city of Little Rock out of its public funds, perhaps supplemented by private subscriptions.

JOHN NOLEN,
Cambridge, Mass.



Gift Restores Lost Park Site to City and Makes Work

ELKHART, IND.—This city has recently acquired by gift approximately 25 acres of wilderness lying within the horseshoe curve of the Elkhart River, and only about eight blocks from the heart of the city. The spot is rich in old traditions. The Potawatomis, who once inhabited this region, had a legend to the effect that when an Indian child died, Manitou erected in the sky here a splendid rainbow whose ends dipped down into the two rivers, the St. Joseph and the Elkhart, according to an account in the local paper, *Truth*. This rainbow was a portage—the Portage of the Souls—suspended from the heavens for the passage from stream to stream of the spirits of Indian children trekking the long trail to the Happy Hunting Grounds.

When John Nolen, city planner, prepared the outline for the Elkhart city plan several years ago, he recommended that this area be transformed into a city park. But it passed, almost in its entirety, into private hands and was apparently lost to the people as a recreation area. Now, thanks to the generosity of the American Coating Co., however, it has been given to the city, and the city is bringing to realization the planner's vision.

The work is being done by the community's unemployed—mechanics, clerks, laborers, temporary sufferers from the depression.

MART R. HOPKINS,
City Clerk.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Zoning Setbacks

ARKANSAS.—*Arkansas State Highway Commission v. Anderson*, 43 S. W. 2d, 356.—Proper zoning ordinances, authorized by a proper state enabling act, are valid exercises of the police power; but a widening of a highway under protection of a town ordinance preventing abutting owners from building within the extended boundaries of the highway is an attempt to take property for public use without just compensation.

Esthetics—Financial Return

CONNECTICUT.—*Thayer v. Board of Appeals of City of Hartford*, 157 Atl. 273.—The substitution for the old building of a new non-conforming structure thrice the size of the old building is such a radical departure from the policy of the zoning ordinance as to be not permissible on grounds of improved appearance and larger returns to the owner.

Housing as a Public Purpose

FLORIDA.—*Hoskins v. City of Orlando*, 51 Fed. 2d, 901.—The city contracted to purchase a 99-year lease on apartment house property, agreeing to pay in stipulated instalments, and subsequently defaulted. This is an action to recover the instalments in default. Complaint dismissed. The operation of an apartment house is not a legitimate municipal purpose; nor can a city, even acting to carry on its authorized powers, contract for more than a reasonable time.

NOTE BY EDITOR.—See page 97; also editorial in *New York Law Journal*, December 3, 1931.

Building Permit—Discretionary Power—Jurisdiction

LOUISIANA.—*Hourgette v. City of Gretna*, 137 So. 344.—The city had adopted an ordinance forbidding the erection of a building without a permit from the tax collector on recommendation of the city engineer. No building code or other standard regulations, however, had been adopted by the city. *Held*, that the ordinance was arbitrary and void.

This action is injunction to prevent interference with the reconstruction of the property damaged by fire. *Held*, that the jurisdictional amount involved is the value of the plaintiff's right to complete his work of reconstruction, and not the entire value of the property.

Zoning — Protest Clause — Residence District—Home for Aged

MISSOURI.—*Women's Kansas City St. Andrew Society v. Kansas City*, U. S. District Court for Western Division, Western District of Missouri, July 20, 1931.—The provision in the zoning ordinance that on protest by the owners of ten per cent of the area affected by an amendment, it shall be passed only by "three-fourths of all the members of the legislative body" of the city, is valid.

The provision of the ordinance placing institutions in residential district Class U. 7, comprising only cemeteries, sewage disposal plants, aviation fields, philanthropic institutions, hospitals, etc.; allocating no special districts for U. 7 uses, but allowing them, on appeal to the Board of Appeals, "in any use district provided such location will not seriously injure the appropriate use of neighboring property," and thus excluding them, except by discretionary action of the Board of Appeals, from the residential districts, is valid. The case of *Village of University Heights v. Cleveland Jewish Home*, 20 Fed. 2d, 743, is distinguished.

Setback Line—Porch—Reasonableness

NEW JERSEY.—*Mulleady v. City of Trenton*, 156 Atl. 843.—Where the words "setback line" are used in an ordinance but not defined, the city's building code, defining the term, may be consulted.

A provision forbidding the enclosure of a porch within the setback line is not valid as a police power measure. The application of a zoning ordinance is unreasonable where the persons in the neighborhood enjoyed a privilege denied the prosecutors, and the proposed enclosure of their porch was harmless and unobjected to.

Garage—Discretion

NEW JERSEY.—*Anderson v. Scotch Plains Township*, 157 Atl. 248.—An ordinance granting the township discretion to refuse a permit for a gasoline tank deemed detrimental to the township interests is valid, since it calls for the exercise of the Committee's reasonable judgment.

Group Garages

NEW JERSEY.—*Hazley v. Mayor and Aldermen of Jersey City*, 157 Atl. 248.—A zoning ordinance excluding group garages from residential districts is valid.

Boards of Appeal—Variance—Temporary Permit

NEW YORK.—*Matter of Ellish v. Zoning Board of Appeals of Ramapo*, 141 Misc. 916.—A provision of a zoning ordinance granting boards of appeal the power to grant temporary permits for non-conforming uses is void, since it is not authorized by the town law.

Eminent Domain—Light and Air

NEW YORK.—*In re Elevated Railroad Structures*, 253 N. Y. S. 743.—On the city's condemnation, the elevated railroad is entitled to compensation for right to impair light, air and access acquired by prescription.

Garage — Non-Conforming Uses

NORTH CAROLINA.—*City of Elizabeth City v. Aydlett*, 161 S. E. 78.—Zoning ordinances excluding gasoline filling stations from certain districts are valid, notwithstanding financial loss is caused the lot owner; and are not unlawfully discriminatory because allowing the maintenance of previously erected stations.

NOTE BY EDITOR.—The decision is given here on account of the comparative scarcity of zoning decisions in North Carolina.

Zoning—Residence Districts

TEXAS.—*Continental Oil Co. v. City of Wichita Falls*, 42 S. W. 2d, 364.—The ordinance in question provided for the regulation of the granting of permits for the erection of business structures and the conduct of certain businesses within certain districts called residence districts. Under it a permit for a filling station was denied. *Held*, that the ordinance was unconstitutional, in that the station was not a nuisance.

The Court calls attention to the fact that the ordinance could not properly be called a zoning ordinance, and expressly refrains from passing upon the validity of zoning ordinances.

Non-Conforming Use

WISCONSIN.—*State ex rel. Schaet v. Manders*, 238 N. W. 835.—The owner's right to continue a non-conforming use of premises under a zoning ordinance is a right to be enjoyed until he voluntarily abandons it. The fact that a dairy business of this sort was not conducted in a building for several months after the tenant's insolvency is not such a failure to continue it.

The Zoning Ordinance of Charleston

To the Editor of THE AMERICAN CITY:

We have read with much interest the news item about the zoning ordinance of Charleston, S. C., in your December issue. We are particularly concerned with the statement that an unusual provision of the ordinance is an exercise of the police power for an esthetic purpose because it requires plans for future improvements in "Old and Historic Charleston District" to be approved as to exterior architectural appropriateness by a Board of

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Architectural Review as a prerequisite for a building permit. Offhand, such a requirement does appear to be an exercise of the police power for an esthetic purpose and, if included in the zoning ordinance of most cities, it unquestionably would be. In its application at Charleston, however, this is not the case.

Charleston is a unique community. It is known as America's Most Historic City. This designation probably may be disputed by other American municipalities. Certainly, however, no other city possesses the rare heritage of districts so predominant in the distinctive aspects of America's original home life and history.

The greater portion of lower Charleston of today—the site of early Charlestowne, settled about 1670—is almost entirely developed; and practically all the existing buildings date back to epochs of America's history. This, principally, is the section of the city designated by the zoning ordinance as "Old and Historic Charleston District." A painstaking survey of the district brought to light very impressive information. The area occupies about one-third square mile. Within it are between 500 and 600 dwellings. More than 80 per cent were built before the war between the states; and 52 of them, erected prior to 1776, were homes of Charlestonians active in bringing about the independence of our country. Almost every one of the remaining buildings, homes built since 1860, has the appearance and atmosphere of their earlier associates.

This district exemplifies a genuine *non-artificial* early American settlement and a history of American fortitude, courage, culture and tradition. It is a section handed down to the present generation unspoiled despite onslaughts by pirates, Spaniards and Indians; hardly marked, although a point of attack in both the Revolutionary and Civil Wars; living today, unmarred, though threatened by an earthquake, a hurricane, several severe conflagrations, and even the march of American progress. Love of this district, fate and perseverance have preserved its characteristics. It is a real monetary asset for the present generation to enjoy and for Charleston, as a tourists' city, to derive benefits therefrom. The zoning ordinance seeks to prevent man, sometimes thoughtless in his desire for changes or modernistic surroundings, to unwittingly destroy these aspects, which have so wonderfully withstood the adversities of war, the elements, time and man's vacillating whims.

The best interests and welfare, not only of those within this district, but as well of the city and probably the nation, are woven into the unusual characteristics of Old and Historic Charleston District; and the primary purpose of the unusual requirement of the Charleston zoning ordinance is to promote these interests. This requirement is not an exercise of the police power in the interest of esthetics only. Instead, it is a part of a practical zoning plan designed to fit the particular, *and in some instances peculiar*, local community needs and circumstances. While it does accomplish the advancement of esthetic development, this is incidental to the principal purpose of promoting general welfare and is but one feature of the comprehensive zoning plan. As such, this specific requirement comes well within the meaning and intent of the South Carolina Zoning Enabling Act which states: "*Regulations shall be made with reasonable consideration to the character of the district and its peculiar suitability for particular uses, and with a view of conserving the value of buildings and encouraging the most appropriate use of land.*"

JAMES H. ALLEN.
Assistant Engineer, Morris Knowles, Incorporated, Consulting Municipal Engineers.

RECENT CITY MANAGER APPOINTMENTS

E. P. BRIDGES has been appointed the first City Manager of Toccoa, Ga., effective January 1. Mr. Bridges was City Clerk of Griffin, Ga., from 1913 to December, 1918, when he was appointed City Manager of Griffin, in which capacity he served until December, 1929.

M. S. Couch, former City Clerk of Daytona Beach, Fla., became City Manager of that city in January. J. T. Nelson resigned that position because of ill health.

L. M. Dissinger, former City Engineer and Street Commissioner of Oakwood, Ohio, was appointed the first City Manager of that city, effective January 1, 1932.

F. D. Farnsworth, City Manager of Fort Fairfield, Maine, since 1927, has been appointed the first City Manager of Brewer, Maine. From 1911 to 1927, Mr. Farnsworth was engaged in engineering activities in Canada and Maine.

Ralph E. Garvin, of Cleveland Heights, Ohio, was appointed City Manager of Springfield, Ohio, to succeed Clyde E. Wallingford, who was appointed the first City Manager of Newport, Ky.

C. A. Harrell, City Manager of Portsmouth, Ohio, since January 1, 1930, has been appointed the first City Manager of Binghamton, N. Y., effective January 4. Prior to his appointment at Portsmouth, Mr. Harrell had been Assistant City Manager of Cincinnati under Colonel C. O. Sherrill. He holds degrees from Randolph-Macon College and the School of Citizenship and Public Affairs of Syracuse University.

H. D. Palmore, until recently Chief Engineer of the Kentucky State Highway Commission, was appointed City Manager of Covington, Ky., under the new council-manager charter effective January 4. He succeeds O. A. Kratz, who has been City Manager under the commission plan in accordance with a special agreement with the Commission.

William B. Patterson was appointed City Manager of Auburn, N. Y., to succeed John F. Donovan, resigned.

C. Arthur Poole, a former City Engineer of Rochester, N. Y., was appointed City Manager of Rochester on January 2, 1932. He succeeds Stephen B. Story, who had been City Manager for the previous four years.

Mrs. May J. Priestley was appointed City Manager of Ft. Pierce, Fla., on December 26, to succeed E. C. Gustafson, for whom she had worked as secretary.

James G. Wallace of Ridley Park, Pa., was appointed the first City Manager of Bangor, Maine, effective January 1. Mr. Wallace is a graduate of the University of Maine and has held various engineering positions, including one with the Federal Government.

Edmund H. Waterhouse, of Park Ridge, Ill., was appointed the first City Manager of Glenview, Ill., on January 8, 1932.

Arthur H. Wedge, City Engineer of Wooster, Ohio, has been appointed the first City Manager of Bedford, Ohio.

Frank C. Woglum succeeded C. B. Salisbury as City Manager of Sherrill, N. Y., on January 1.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

MODERNIZED GOVERNMENT FOR NEW YORK CITY?

SAMUEL SEABURY, counsel for the joint legislative committee that has been investigating the administration of the city of New York, rendered on January 25, 1932, an intermediate report on the disclosures of the investigation. In his conclusion Judge Seabury makes the following suggestions, indicative of the city manager plan in some form or adaptation, after recommending the elimination of many employees and officials, and even some departments:

"But even structural changes of this nature will not alone be sufficient to make the city of New York the great self-governing community that it may become —able to protect itself from the corruption incident to its functions being controlled for the benefit of a political group. Evidence will be presented to the committee that will enable you to pass judgment upon the advisability of recommending some plan which will make it possible for the administrative functions of the city to be performed exclusively by competent administrators who will be free from political control.

"Evidence will also be presented which will enable the committee to determine whether or not it would be wise to recommend to the Legislature the adoption of some system of proportional representation and preferential voting within the city of New York."

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Abutters' Rights

Where railroad right-of-way bisecting lot was an easement and not fee title, whole lot held to abut on street for purpose of assessing damages for changing street grade (Tennessee Supreme Court: *City of Knoxville v. Phillips*, 36 S. W. 2d, 434).

Alleys

Abutters waiting until alley drainage improvement was virtually completed forfeited any right to enjoin excavation, but could recover any damages actually sustained (Texas Court of Civil Appeals: *Smiley v. City of Graham*, 37 S. W. 2d, 289).

Bond Sales

Statute prohibiting sale of bonds below par held violated by sale at par with allowance to buyer for attorneys' fees and other expenses, although municipality could have incurred such expenses (Kentucky Court of Appeals: *Duff v. Knott County*, 36 S. W. 2d, 870).

Business Regulations

Ordinance against sale or distribution of ice manufactured outside the city, "except ice manufactured wholly with distilled water," held void as discriminating in favor of ice made of raw water in the city (Texas Court of Civil Appeals: *City of El Paso v. Jackson*, 40 S. W. 2d, 845).

Civil Service

Charter provision for filing "written charges" against civil service employees held not to require the charges to be verified by oath (California District Court of Appeal: *McGinn v. Department of Public Health of City and County of San Francisco*, 298 Pac. 118).

Contracts

Although city official's contract to sell goods was not binding on city because not properly authorized, buyer was liable for market value of goods received by him (California Supreme Court: *City of Pasadena v. Estrin*, 298 Pac. 14).

Contract with an association of architects for services held invalid for want of competitive bidding and for legal incapacity of association (Colorado Supreme Court: *Johnson-Olmsted Realty Co. v. City and County of Denver*, 1 Pac. 2d, 928).

Exercise by municipality of statutory authority to determine the responsibility of prospective bidders for public contracts held reviewable by the courts only when fraudulent (New Jersey Court of Chancery: *Araneo-White Construction Co. v. Joint Municipal Sewer Commission*, 154 Atl. 313).

Contract employing architect for projected building held inapplicable to building erected, after abandonment of original project, along different lines and at greatly increased cost (New York Supreme Court, Westchester County: *Rockart v. City of Mt. Vernon*, 251 N. Y. S. 514).

Driveways

In filling station case where owner insisted on particular entrance location, held that proposed use of driveways crossing a sidewalk must be reasonable, and unusual hazard to traveling public may outweigh inconvenience and disadvantage to the owner (New Hampshire Supreme Court: *Town of Hilton v. Sharpe*, 155 Atl. 44).

Franchise Taxes

Statute permitting deduction from motor-bus franchise tax of charge for carrying policemen, etc., held not invalid as imposing upon one municipality the cost of transporting other municipalities' policemen, etc., nor as amounting to a lending of municipal credit (New Jersey Supreme Court: *City of Newark v. Public Service Co-Ordinated Transport*, 155 Atl. 469).

Highways

City liable for damaging abutting property in so grading a street and cutting a ditch as to divert the natural course of surface waters; city being bound to provide channel to care for water diverted (Texas Commission of Appeals: *City of Wichita Falls v. Mauldin*, 39 S. W. 2d, 859).

Local Assessments

Statute exempting incorporated cemetery association from special assessments held not to extend to unincorporated associations; statutes exempting from such assessments being strictly construed (New Jersey Supreme Court: *Vail v. Inhabitants of Plainfield*, 155 Atl. 679).

Municipal Piers

City held to have properly leased its pier property for amusement purposes, title being held under a grant for such use (Texas Court of Civil Appeals: *City of Port Arthur v. Young*, 37 S. W. 2d, 385).

Municipal Property

Contract between city and company to acquire property, city's part to be used for parks and company's part for housing upheld (New Jersey Supreme Court: *Simon v. O'Toole*, 155 Atl. 499).

Occupation Taxes

An ordinance imposing an annual $100 license fee against non-resident distributors of gasoline within the city upheld; a like tax being imposed against resident dealers under another ordinance provision (Alabama Supreme Court: *Town of Guntersville v. Wright*, 135 So. 634).

Ordinance

A publication of an ordinance not showing the essential terms of the ordinance held invalid (Connecticut Supreme Court of Errors: *Katz v. Higson*, 155 Atl. 507).

Parks

Township held not precluded from purchasing lake and surrounding grounds on theory that title or right of user had already been acquired by dedication and permissive use (New Jersey Court of Chancery: *Soper v. Conly*, 154 Atl. 852, 153 Atl. 586).

Paving

Selection of a patented type of paving material held discretionary with municipal authorities, in the absence of fraud, etc. (New York Supreme Court, Monroe County: *Burns v. Broderick*, 251 N. Y. Supp. 788).

Public Utilities

Contract to purchase ice and power plant, to be paid for in monthly installments, with power in seller to take over plant during default in payments, held to violate constitutional prohibition against creating debts beyond funds provided and against granting a franchise, without referendum (Oklahoma Supreme Court: *City of Tecumseh v. Butler*, 298 Pac. 256).

Purchases

Award of contract for furniture on unit basis and without designating delivery time held legal, even if improvident (New York Court of Appeals: *Randolph McNutt Co. v. Eckert*, 177 N. E. 386).

Railroad Crossings

Condemnation of street right-of-way across railroad held to entitle company to award, but not for expense of changing grade, installing gates, etc.; the company being bound "to place and keep in repair such portions of its right-of-way as found to be reasonably necessary and convenient for public streets" (Texas Court of Civil Appeals: *Houston & Texas Central Railway Co. v. City of Houston*, 41 S. W. 2d, 352).

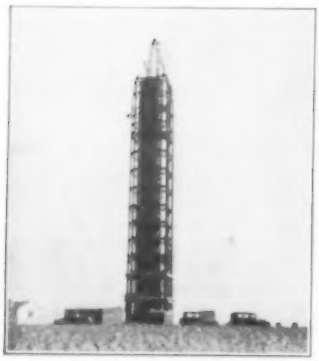
Reservoirs

City held to have acquired the right to discharge reservoir semi-annually into gulch through a practice twenty years old (Washington Supreme Court: *Downie v. City of Renton*, 298 Pac. 454).

Sewers

Establishing village sewer held not unreasonable or oppressive because there was no water system, and courts can interfere with local improvement projects only when same are unreasonable or oppressive (Illinois Supreme Court: *Village of Millstadt v. Beteitschaft*, 176 N. E. 746).

Long Island's State Park Stores Water at Jones Beach in a "Pittsburgh-Des Moines" Tank



The Long Island State Park Commission is conducting an experiment in civic beauty and cleanliness at Jones Beach — an interesting resort near Long Beach on the south shore. Park grounds, walks, beaches, and even the highways are maintained free from the usual litter, trash and picnic refuse of a metropolitan beach resort by vigilant policing—and the public's willing cooperation.

One of the primary essentials was plenty of good, clean water in a quality holder. "Pittsburgh-Des Moines" was called upon for the erection of a 300,000-gallon steel standpipe, shown under construction at the left above, and shown completed (with its ornamental masonry) in the center. This architecturally pleasing tower has a diameter of 19 feet; a height of 150 feet.

At the right is shown a 750,000-gallon elevated tank, 100 feet high to capacity, also erected the past summer by "Pittsburgh-Des Moines" to supply water at adequate pressures to the neighboring city of Long Beach.

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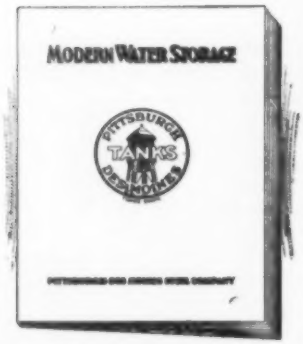

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The Municipal Bond Market

By SANDERS SHANKS, JR., Editor, *The Bond Buyer*

FOLLOWING several anxious weeks of negotiations between the bankers and the city administration, New York City has borrowed $100,000,000 on short-term bonds at 6 per cent. A further promise of a short-term banking credit, through which the two installments of taxes to be collected during the current calendar year will be anticipated, was secured from a large banking syndicate.

The conclusion of these negotiations has been followed by a substantial recovery in the market price of the outstanding long-term bonds of the city and has been beneficial to the municipal bond market generally. For instance, the city of Baltimore, at about the time the New York City financial conferences were approaching a successful conclusion, effected a sale of $4,200,000 4 per cent bonds at a price substantially above the best offer obtainable earlier in the month, and the loan was readily absorbed by investors at a price to yield 4.75 per cent. This was quickly followed by a successful flotation of $5,652,000 Rochester, N. Y., 5 per cent bonds, offered to yield 4.70 per cent.

The municipal bond market, however, still has a long way to go before it can be said that there is any real assurance that the legitimate borrowing needs of cities, counties, towns and districts will be taken care of. As a matter of fact, there is an extremely limited market today for new municipal loans, either of the short- or long-term variety.

The Sunday supplements tell us that the trouble is that American municipalities have been too extravagant, that taxes have been piled on until the breaking point has been reached, and that now the "day of reckoning" has come. The authors of these articles fail to point out that credit likewise is being refused other classes of borrowers. Unfortunately, newspaper publicity is creating the false impression that the American municipality has become, over night, a mighty poor risk—if not hopelessly insolvent!

The typical city is in an unfortunate position. It is more or less true that, taken as whole, municipalities have been on a ten-year spending spree; they have been extravagant to just about the same extent as the individuals in these municipalities have been—in response to the demands and desires of the voters. Eventually, the time for retrenchment arrived. Naturally enough, the typical municipal governmental organization has not responded to the need for economy as quickly, has not prepared for the storm as wisely, as the intelligent individual or private corporation. In fairness to local governmental authorities, however, it should be kept in mind that cities have been urged to help the country through the depression by expanding public works as an unemployment relief measure and as a stimulus to business.

In the closing months of 1931, a wave of liquidation drove bond prices down to the record low level of 1921. Bank credit at the same time was withdrawn to such an extent that dealers were compelled to cease underwriting new bond and note issues, regardless of the rating of the borrower. Investors, noting the abrupt decline in market prices, became alarmed, and a considerable amount of "scare" selling contributed to a further depreciation of market values, which in turn made the position of the banks even more difficult.

In marked contrast with the situation during the past two years, municipal authorities are now endeavoring to satisfy insistent and often unreasonable demands for an immediate reduction of budgets, permanent improvement programs, tax rates, etc., and all this comes, like a bolt out of the blue, at a time when a huge burden of emergency relief work must be shouldered by the municipalities and when tax and other revenues are falling below normal as a result of the generally depressed condition of business. To illustrate the utter confusion of the municipal fiscal situation, attention is directed to the emergency relief bills rushed through the New York Legislature at Governor Roosevelt's request. One of these would permit issuance of five-year bonds to fund 1931 operating deficits; and at the very time it was being speeded to the Governor for his approval, cities are being denied loans until they can show proof of balanced budgets, payroll reductions and other economies.

The following is a list of recent sales of new issues of state and municipal bonds showing the net interest rate at which the loans were placed:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$50,000	Milton, Mass.	4	7½-yr. (avg.)	3.97
2,750,000	California	4½	15½-yr. (avg.)	4.50
400,000	Evansville, Ind.	4¾	5½-yr.	4.63
773,000	Troy, N. Y.	4¾	12½-yr. (avg.)	4.72
150,000	Altoona, Pa., Sch. Dist.	4¾	1-15-yr. (ser.)	4.73
90,000	Kalamazoo, Mich., Sch. Dist.	5	1-9-yr. (ser.)	4.88
33,000	Laramie, Wyo.	5	10-20-yr. (opt.)	4.94
5,652,000	Rochester, N. Y.	5	13¼-yr. (avg.)	4.95
4,200,000	Baltimore, Md.	4	24-yr. (avg.)	4.95
70,000	Scott County, Iowa	5	7-11-yr. (ser.)	4.97
1,000,000	St. Paul, Minn.	5	15 5/6-yr. (avg.)	4.99
110,000	Putnam County, N. Y.	5¼	1-22-yr. (ser.)	5.12
69,000	Fort Lee, N. J.	6	4 1/3-yr. (avg.)	5.70
250,000	Dayton, Ohio	5¾	16½-yr. (avg.)	5.71
150,487	Canton, Ohio	6	6½-yr. (avg.)	5.99
100,000,000	New York, N. Y.	6	3-, 4- & 5-yr.	6.00
750,000	Salt Lake City, Utah	5	1-yr.	6.05

Allotment System Urged as Protection for City's Credit

THE financial stress that the city of New York underwent last month, following the adoption of the largest budget in the city's history, and culminating, after promises of municipal economy, in the 6 per cent short-term loan mentioned above, produced much criticism, destructive and constructive. Among the important suggestions was that of the National Institute of Public Administration for quarterly budget allotments to protect the city's credit by requiring a continuously balanced budget. The method is thus described:

"As used in other jurisdictions, the budget allotment system operates as follows: At the beginning of the year, 5 or 10 per cent of the annual appropriation of each department is set aside as an emergency reserve. None of this can be spent without the approval of the chief executive. The remainder is apportioned on a quarterly basis, and the first quarter's allotment is approved for expenditure by the chief executive. This allotment is set up on the comptroller's books and limits the department's expenditures just as if it were an appropriation. Before the next quarter begins, a further allotment is approved, and so on through the year.

"This allotment system applies principally to the regular departments, as the allotments for contracts cover the full amount and period of the contracts. With such an allotment system, it is possible not only to review and limit the expenditure programs of the departments from quarter to quarter as the work progresses, but also to make the expenditures conform to the revenue realizations. Where there is no allotment system, expenditures will go on up to the full amount provided in the budget, if not beyond this figure, and any shrinkage in receipts will inevitably produce a deficit."

EDITORIAL NOTE.—A monthly budget allotment system for municipalities large or small is described in a report (No. 1291) recently issued by the New York State Conference of Mayors. It is based on the systems in effect in Buffalo and Syracuse and a recent study by A. E. Buck of the National Institute of Public Administration. It calls for monthly allotments of departmental appropriations and monthly allocations or estimates of municipal revenues, with periodic statements that will reveal the status of allotments, expenditures and receipts. The report is unfortunately not published, but Mr. Buck's recommendations have recently been published by the Municipal Administration Service, 261 Broadway, New York, in "Budgeting for Small Cities" (25c), noted in this magazine last November at page 117.

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Collecting Claims for Damages to Hydrants

IN response to a request from a New York State city for information regarding the best plan to follow in procuring settlement of claims for damages to water hydrants by auto collisions or other accidents, the New York State Bureau of Municipal Information secured an abundance of information from cities throughout the United States. The replies abstracted below were selected chiefly to illustrate the diversification of methods used to collect for damages.

Connecticut

Meriden, Conn., finds that the best answer to this problem is to so place the hydrants that they will be protected against being struck by automobiles. Very little trouble has been experienced in this city. During the past five years fully 90 per cent of the damage done to hydrants by motorists has been reported to the Police Department by the parties doing the damage.

Illinois

The Department of Police of *Chicago, Ill.*, is under orders to inform the Bureau of Engineering whenever a fire hydrant or other apparatus is damaged by an automobile collision or otherwise. The police officer secures the vehicle license number, state license number, name of automobile owner and names of witnesses, and refers all matters to his commanding officer, who in turn refers them to the Chief of Police. From that office the information is sent to the Bureau of Engineering. The Bureau has an investigator of damage whose business it is to run down immediately all information given by the police officer or others. The hydrant is then repaired and a bill for the cost sent to the party causing the damage. It is the experience of this department that only about 50 per cent of the full value of damage costs are collectible. The City Council frequently settles for smaller amounts, since in many cases the party causing the damage is irresponsible financially and, too, the cause of the damage may not have been through any carelessness on the part of the driver, but in connection with the safeguarding of life.

In *Rock Island, Ill.*, a report is generally received from the parties concerned, for the law requires that every accident and any damage to property must be reported to the local Police Department at once. Each case is handled either through the Police Department or through the insurance company, if the owner of the car is insured.

Iowa

The Iowa State Law provides that anyone involved in an automobile accident, whether a person is injured or not, must report to the police department at once. *Cedar Rapids, Iowa*, finds that this helps to get correct information as to who is responsible for the breaking of a fire hydrant by an automobile or truck. Of course, there are instances where the driver disappears without making such a report, but if he is found he will be subjected to a penalty for failure to make a report. The city has not been able to make collections in some cases because of insolvency or for other reasons.

Louisiana

When the Water Department of *New Orleans, La.*, is notified of damage to a hydrant, an inspector is immediately sent out to secure all possible data regarding the accident. The party believed to be responsible is billed for the damage and, if the bill is not settled, suit is brought, which generally results in prompt payment. Whenever two cars are involved, each driver is billed for one-half of the damages. If the Department is not successful in collecting, suit is brought against both parties, and the courts determine which one must pay. It has never been found difficult to secure the correct license number. If the person doing the damage is not financially responsible, no time is wasted on the matter and it is charged off.

Massachusetts

The Police Department of *Boston, Mass.*, submits a report in the case of each hydrant damaged by an automobile, stating all the circumstances in connection with the damage, such as the time of the accident, make of car, registry number of the car, owner's name, license number of the operator, and his name. With this information at hand, after the damages are repaired, a bill covering the cost of the work is forwarded to the owner of the car. In many cases the insurance company settles without comment or controversy, while in other cases the Law Department of the city proceeds to collect, if possible.

Brockton, Mass., collects damages on about 75 per cent of broken hydrants. Some hydrants are broken at night and the water valve does not let go, so that the car gets away without being seen. Also, some are broken by those who have no money, or the car is not worth anything. It is a law that the driver must report to the police station as soon as possible. Quite a number of cases are reported in this way, but if the owner has no money or he is not found, it just means red ink.

In *Chicopee, Mass.*, the bill for repairs and damages is generally taken care of by the insurance company. The percentage of drivers who escape after hitting a hydrant is very small here, for the city standardizes on a type of hydrant which immediately upon being hit throws a stream of water over the car and driver. The driver generally becomes frightened and immediately takes steps to report the accident and have the water shut off. The Water Department frequently carries an advertisement in the local paper telling what a serious matter a broken hydrant may become in case of fire and stressing the importance of reporting immediately any damage done to hydrants. The person who hits the hydrant is billed for all labor and material, together with a charge for the water wasted, based on the length of time the water leaks away after the hydrant is struck.

Fall River, Mass., depends upon the police or citizens to report the breaking of hydrants to the Water Department. The offender is billed for the damage, and if he does not pay, his driving license is liable to revocation by the state authorities. Over a period of years the records show that collections have been made in about 60 per cent of the cases.

Most cases of broken hydrants in *Holyoke, Mass.*, are reported by the Police Department, in which case no trouble is experienced in collecting. As 90 per cent of the hydrants are of the type that do not leak when broken, some of the drivers try to get away if there is no one to see the accident. The inspector frequently finds hydrants that were broken and never reported.

In simple cases where a carelessly driven car breaks the hydrant, the *New Bedford, Mass.*, Department is usually able to get the number and thus locate the owner. If he is a responsible party or carries property damage insurance, the collection is quite simple. In cases where two or more cars are involved, each driver will usually blame the other. A bill is usually rendered to the owner of the car which hits the hydrant, and an attempt is made to make him or his insurance company settle the liability. There are some cases so involved that it is cheaper to forego the collection than to try to straighten the complications. It is also found difficult to collect in cases where the owner of a car causing the damage has no property or has not insured against property damage.

In most all cases in *Springfield, Mass.*, where hydrants are broken or damaged by autos, it is possible to get the number on the license plate, and the name and address of the owner, from the Police Department. The hydrant having been repaired or replaced, a bill is sent to the owner of the car. If the car is covered by property damage insurance, it is generally possible to collect, but if insurance is not carried and the owner is not financially able to pay, it must be charged off the books. The former City Solicitor of this city was of the opinion that to collect the bill by bringing suit, it was necessary for the Department to prove carelessness or negligence, which would be hard to prove if no one saw the accident. The State Registrar of Motor Vehicles says that under the law he cannot take away the license of a car if

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the owner does not pay a bill of this kind.

When a hydrant is broken in *Taunton, Mass.*, all possible means are used to find the owner of the car, the main reliance being upon the Police Department. If the car is insured against property damage, the Department receives payment, but if it is not insured and the owner is not a local resident, more frequently payment is not made. The fact that it is a crime to go away without giving notice if property damage is done, generally causes the automobilist to report the accident to the police.

Michigan

The information regarding broken hydrants usually comes to the Water Department of *Highland Park, Mich.*, from the Police Department. Frequently a charge of reckless driving is registered against the driver. A bill for repairs is presented, and in many cases a settlement is made at the time of the hearing in court. If he is unable to pay the full amount, installments are sometimes allowed. The Legal Department of the city is usually given the case to handle as soon as all the facts are ascertained.

Kalamazoo, Mich., depends upon its police officers for fixing the responsibility for accidents of this sort, although it has been of very great assistance to have the Department's own emergency man get to the scene of the accident as quickly as possible. In cases where the owner of the car is also a water customer, the amount of the claim has often been added to the water bill and a threat made to turn off the water if the claim was not paid, although the Department really has no legal right to do this.

New Jersey

In *Hoboken, N. J.*, the Water Department and Police Department hold the driver of the car until the damage is estimated. If payment is not made, he is given a jail sentence.

New York

In *Buffalo, N. Y.*, the Water Department receives a police report, furnishing the license number and name of the operator of the car which actually struck the hydrant. The Police Department also sends a copy of this report to the Corporation Counsel and to the Collector of Arrears. After repairs are made, a bill is forwarded to the owner of the automobile. Many of these cases are settled by the insurance carrier. There have been a few cases where the owner's financial condition would not permit of immediate settlement. Monthly payments are then accepted until the full settlement is made. Very little trouble has been experienced in the settlement of these bills.

Jamestown, N. Y., has a great deal of trouble due to fire hydrants' being broken late at night and the driver's escaping before information can be secured. An effort is made by the Water and Police Departments to check up the garages, and in this way it is often possible to locate cars that have been brought in for repairs and on which are marks such as paint the color of the hydrant. Where the damage has been caused by responsible parties who are covered by insurance, they generally report to the Water or Police Department, and the insurance company is very willing to pay the full extent of the claim. Tracing the cars through license numbers has not been found satisfactory, for the cars change hands frequently and the transfer is not always handled in a legal manner.

Mount Vernon, N. Y., has found it difficult to collect for damages to fire hydrants except in a very few cases. In many instances the person doing the damage drives away without anyone's getting the license number of the car. In cases where a police officer witnesses the accident or is called to the scene, he takes the license number of the car, the owner's name, etc., and this information is furnished to the Water Department. As soon as the hydrant is repaired, a bill is rendered to the owner of the car, who turns it over to the insurance company, if he is insured. It has been found that the insurance companies, with few exceptions, fight these claims, and the amount of money involved is usually too small to warrant a suit.

In *Schenectady, N. Y.*, the local police assist in getting information as to the names, license numbers, etc., of those who damage fire hydrants, but there has been some difficulty in collecting the charges. If the damage is done by a property owner of the city, a bill is rendered and, if not paid, the amount is added to the tax rolls to be collected with the regular taxes. If a non-resident breaks a hydrant, the matter is adjusted through an insurance company if the party is insured, but it has been the experience of the Department that at the end of each year there are a number of these small items on the books which are uncollectible and eventually have to be canceled.

Great difficulty is experienced in *Yonkers, N. Y.*, in establishing claims for broken hydrants. As a rule, records are obtained from the Bureau of Public Safety, which endeavors to secure the necessary information. When the proper information has been obtained, a bill is rendered to the owner and notification is made to the Corporation Counsel. If the claim is ignored, the charge is turned over to the Law Department for final collection. If the driver is arrested, the case is held open by the court until the damages have been paid in full.

Ohio

As a general rule in *Akron, Ohio*, these accidents are of such nature that the Traffic Department of the city is called out to investigate, although in many instances the Water Department is called direct. The number of the car causing the accident is secured and the owner held responsible for the damages done. In case an arrest is made by the Traffic Department, the cost of the damage is estimated and the city collects the entire amount or makes arrangements for its payment before the driver is released.

In all cases where hydrants are damaged by auto collisions or otherwise in *Cleveland, Ohio*, the City Water Department receives a copy of the police report covering the accident. This report contains the owner's name and address or the license number of the machine that caused the damage. After repairs are made to the hydrant, an invoice covering the cost of making the repairs is mailed to the owner of the automobile and, if not paid within a reasonable time, the account is turned over to the attorney for the Department of Public Utilities, who called in the person against whom the bill is rendered. If a settlement is not made at that time, the person is sued. In almost all instances, no trouble is experienced in collecting.

Columbus, Ohio, has a city ordinance which requires policemen to report all injuries to persons and damages to property resulting from collisions or other accidents. The city also has a radio broadcasting system with radio cruisers, which are directed to the scene of the accident and frequently procure information which is reported to headquarters. A record is made by the record clerk in the Police Department. Eye-witnesses and city employees frequently report to the city or to the police damages caused by automobiles or otherwise.

In *Cincinnati, Ohio*, directions have been given to the police to arrest all persons damaging city property by automobile and charge them with reckless driving. If convicted in Traffic Court, they are fined the penalty for such violation or reckless driving. The city department controlling the property that has been damaged bills the party in all cases, whether he is found guilty or dismissed. If an excuse regarding his financial condition is submitted, the case is referred to the Department of Public Welfare and weekly payments are recommended when the case warrants. When two parties are concerned because of a collision and a question of law is involved, the case is referred to the City Solicitor, who also receives the case when payment is refused. All money collected is turned over to the City Treasurer.

Oklahoma

Muskogee, Okla., does not undertake to collect damages for the breaking of fire hydrants by automobiles or otherwise, as most of the damage happens through unavoidable accidents and usually by drivers trying to avoid collisions.

Pennsylvania

In *Allentown, Pa.*, the owner of the car must place a deposit of $150 with the Water Department until repairs are made. Only the actual cost of repairs is charged and any money remaining or still due is returned or collected from the owner. The cause of the accident as regards the driver is handled by the Police Department. Very few cases of this sort are lost, for the Police Department is held responsible if the driver or owner is not located.

The collection of claims in *Erie, Pa.*, has given the Water Department consid-

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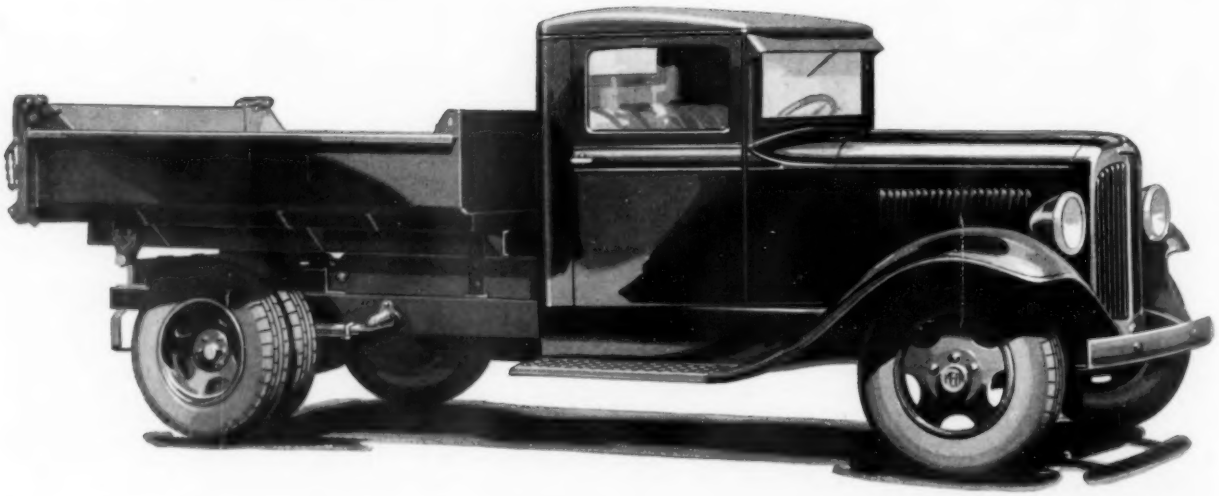

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erable annoyance. Where responsibility for the damage is definitely placed, little difficulty is encountered, although it is often necessary to resort to a partial payment plan. After exhausting the ability of the Department to determine the responsibility and make collection, the claim is referred to the Legal Department. After investigation, if it is found impossible to force collection without legal measures, the claim is written off.

Lancaster, Pa., has been very fortunate in collecting most of the charges for damages to hydrants. If the statement is not paid promptly, it is turned over to the City Solicitor's office for collection.

Rhode Island

In *Providence, R. I.*, little or no damage to water hydrants is experienced, for the flush type, or Providence pattern, is used. It is occasionally necessary, however, to replace inlet stones, etc. Inasmuch as all property is under police protection, the Water Department looks to the Police Department to investigate and secure the necessary facts before reporting.

South Carolina

Little trouble is experienced in *Charleston, S. C.*, when the owner of the car carries insurance against accident to property, for the insurance companies are very willing to settle any claims. No charge is made for the water wasted, but the car owner is billed for the actual cost of replacing the defective hydrant, new parts if required, labor, material, and supervision and use of tools, which are estimated at 10 per cent of the total cost of material and labor.

Virginia

In *Newport News, Va.*, practically all accidents to fire hydrants are reported to police headquarters either by the driver or by others. The cost of repairing the hydrant is paid by the party responsible, before final disposition of the case in the Police Court.

Portsmouth, Va., obtains the name of the person driving the vehicle, by checking the state license number. He is notified at once of the amount due, summoned to court for reckless driving and destroying city property, and advised at the same time that if the amount due is paid before the case is heard in court, the Water Department will not press the charges.

The Police Department of *Richmond, Va.*, is generally notified by the operator of the automobile in case of damage to a fire hydrant. In some instances, the driver will try to get away, but it is generally possible to get the license number. The driver is placed under arrest by the Police Department and a bill is sent to him, covering the damages. If the bill is paid as presented, no further action is necessary. In the event, however, that the bill is not paid within 30 days from the date of the accident, the operator of the car is placed in the Police Court and is required to pay a fine in addition to the bill as presented.

Under the present law in *Roanoke, Va.*, such a collision is a civil matter and is subject to regular suit in a civil court. In practically all cases, material damages to the automobile result. Where it is possible to secure the license number, the owner of the car is found and evidence gathered as to his responsibility. The Department has not always been successful in collecting damages, but suit in this case is merely judgment for admitted debt, and the Department has not been faced with the proposition of proving damage.

Wisconsin

Kenosha, Wis., has very few cases where it is not possible to place the responsibility through the assistance of the Police Department, or the cooperation of citizens.

In *Milwaukee, Wis.*, fire hydrants damaged by accidents are generally reported by the Police Department, which furnishes the Water Department with the license number of the car, owner's name, and particulars regarding the accident, together with names of witnesses. After the hydrant is repaired or replaced, the bill is turned over to the City Attorney for collection. If the owner of the car carries insurance and is to blame, there is little trouble in collecting, but occasionally the owner carries no insurance or is so financially situated that the claim cannot be collected. Where there is some doubt that the owner of the auto is entirely to blame, because of a slippery pavement or swerving to avoid hitting a pedestrian, the City Attorney makes the best settlement he can. About two out of every five claims are collectible and paid.

Tennis on a Reservoir

SIX FULL-SIZE COURTS

FOND DU LAC, WIS., had a water-tank in need of repairs. The Fond du Lac Tennis Club lacked courts. A young man employed in the city engineering department was also an enthusiastic tennis player. He evolved a plan by which Fond du Lac now has six full-size tennis courts on the top of the city water reservoir.

This came about through a slightly new variation of the fairly familiar practice of public-private cooperation in financing recreation projects not strictly to be classed as public in character. The Tennis Club originally proposed leasing the space on top of the reservoir and developing the courts one at a time as it could raise the money. The city felt that this procedure was entirely unsatisfactory and countered with a suggestion which has now been carried out.

The City Council surfaced the entire area, paying for it and allowing the tennis club to repay the total cost of $4,700 in instalments over a period of ten years. The contract provides that if the club fails to pay for one year, it forfeits the courts to the city.

Fond du Lac had no tennis courts fit for the use of thoroughly practiced, scientific players. There were a few mediocre courts in the parks, but it was useless for the city to put them into first-class condition, as with promiscuous use they would not remain so for any length of time.

It was felt, likewise, that it would be an injustice, even if it were possible, to induce the city to float a bond issue to provide courts of tournament quality, thereby asking the mass of taxpayers to pay for something which would be of use, or even of interest, to a small percentage of their number.

To repair the reservoir, the city tore off the old wooden top, lined the ancient earth-and-stone tank with gunite and built a new 5½-inch top of concrete, supported by concrete columns, with a 12-inch layer of clay for insulation. This clay serves the double purpose of protecting the concrete from sudden and severe weather changes, and keeping the contents of the tank at an even temperature.

When they had thus finished the top for their own purposes, they added, after the plans of the club, a 4-inch top of concrete for the courts. The material for this was colored in the mixing, to prevent glare, lamp-black being found inexpensive and satisfactory for the purpose.

The top of the reservoir is 7 feet from the ground, easily reached by a flight of steps. It is 138 x 240 feet in size. Maintenance of the concrete by the city is provided for the contract, all equipment and its care being the business of the club.

RITA PIATT O'BRIEN.

An Invitation Is Extended

to other publications to use material appearing in THE AMERICAN CITY so long as the source is credited.

Highway Upkeep Expenses Reduced
State's 1930 Maintenance Bill 1503,000 Lower Than in 1929
SPEEDING UP PAVING PROGRAM IS URGED
TO SPEED OPENING OF NEW HIGHWA
TRUNK HIGHWAY SYSTEM GROWS TO 7000
Counties to Get More Highway Aid
STATE WILL OIL GHWAY NO. 22
From Hutchinson to
e on Schedule for
ement in 1930

Minnesota State Highway No. 3—Wabasha to Lake City

Progressive Highway Departments are Helping to Relieve Unemployment by Carefully Planning their Road Construction Programs

Management in road building must now solve two big problems . . . give taxpayers the greatest return on their money with most miles of paved roads suitable for all traffic conditions . . . relieve unemployment most effectively by even distribution of work throughout the state.

Minnesota solved both problems this year by constructing low cost roads. The advantage of low cost roads is obvious . . . more miles of smooth durable paved roads per dollar invested, permitting wider division of road funds with more even distribution of employment.

Roads and pavements built with Standard Asphalt Road Oil not only can be constructed at low cost but because of their durability and resistance to traffic wear, can be maintained at a very small expense. Today, when every road building dollar needs to be used to the best advantage, not only in road mileage but also employment relief no highway builder can afford to overlook the advantage of Stanolind Asphalt products.

All of the states in the middlewest are relieving unemployment to the greatest extent.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

City Planning

Planning Problems of Town, City, and Region.—Annual Proceedings of the National Conference in City Planning, 1931. 235 *pp.* $3.00 *from* THE AMERICAN CITY.

Recent advances in the art and the science of planning in this country are critically scrutinized in the appraisal of results in over 800 communities (and of zoning in nearly 1,000 communities) given by the Conference President, Harland Batholomew, in the opening paper of this volume, under the title, "Is City Planning Effectively Controlling City Growth in the United States?" "Master Plans and Official Maps," "Planning Programs for Small Cities," and "County Planning," are the titles of other important papers and discussions. Zoning administration, mass transportation, the planning of expressways to preserve community integrity, and special assessments, have places of major importance; and European planning, architectural control and other subjects are included.

A Traffic Survey

The Traffic Committee of the Engineering Society of Buffalo, N. Y., with the cooperation of the Boy Scout organization of that city, is responsible for a thoroughgoing field survey, the report of which is available in a 16-page mimeographed booklet. The procedure followed, the descriptions of the various field traffic counts, and the analyses of findings, offer interesting suggestions to local groups elsewhere interested in the technique of survey making, as do the various charts and tables. $5.00. (Apply to Engineering Society of Buffalo, Buffalo, N. Y.)

City Planning

An excellent introduction precedes the "Progress Report—1931" of the City Planning Commission of the city of Yonkers, N. Y. In preparation for a Comprehensive City Plan, the Commission "set itself to analyze past and present trends, to the end that a clear picture of probable future city requirements may be completed." Facts, conclusions, predictions and recommendations are presented. 138 pp., illustrated. Available to planning officials on special request. (Apply to the City Planning Commission, Yonkers, N. Y.)

Traffic Signs

"A Standard Code for Traffic Signs, Warning Beacons and Islands" is the title of Traffic Bulletin No. 3 of the Massachusetts Department of Public Works. The standards and procedure presented will be followed by the Department in making installations and in judging applications of cities and towns for approval of such regulatory devices. The recommendations guarantee, it is stated, that Massachusetts will be in harmony with standard practices followed in other states. 71 pp. 25c. (Apply to the Department, State House, Boston, Mass.)

Port Authority

In a brief article on "What Is a Port Authority?" in the December number of *The Clevelander*, monthly journal of the Cleveland Chamber of Commerce, Edgar B. Thomas, consulting engineer, gives a résumé of the kinds of port authorities that exist and how they operate. Copies of *The Clevelander* are 20c each. (Apply to the Chamber of Commerce, Cleveland, Ohio.)

Highway Building

"Highway Building with Particular Reference to the Federal Employment Program," Bulletin No. 24 of the American Road Builders' Association, consists of (1) a committee report on Highway Finance and Administration, includ recommendations and summaries of existing methods of administering and financing highways in the 48 states; and (2) a report submitted by T. H. MacDonald, Chief, U. S. Bureau of Public Roads, on highway income and expenditures and the effect of Federal aid on unemployment. 28 pp. (Apply to the Assn., National Press Bldg., Washington, D. C.)

A. S. T. M.

The weighty volumes of the "Proceedings of the Thirty-Fourth Annual Meeting" of the American Society for Testing Materials represent 1,119 and 1,027 pages respectively. Part I includes committee reports, new and revised tentative standards, and tentative revisions of standards. Part II reprints the technical papers which were given at the annual meeting of the Society in June, 1931. Each volume of the "Proceedings" is available at the following prices: $5.50, paper binding; $6.00, cloth binding; $7.00, half leather. The Society's yearly "Index to A. S. T. M. Standards and Tentative Standards," as of September, 1931, is also available. (Apply to the Society, 1315 Spruce St., Philadelphia, Pa.)

Manhole Frames

A proposed American tentative standard on "Manhole Frames and Covers" has been prepared by a technical committee of the American Standards Association and is published for general comment and criticism. The committee solicits constructive suggestions. 27 pp. (Apply to the Assn., 29 W. 39th St., New York.)

Snow Removal

An ordinance regulating the removal of snow and ice from the sidewalks in cities and villages, which places the duty of removal upon the lessee or occupant of each parcel of real estate is presented under the title of "The Removal of Snow and Ice from Sidewalks" in the December number of *The Municipality*, published by the League of Wisconsin Municipalities. Copies of *The Municipality* are 25c. (Apply to the League, 114 N. Carroll St., Madison, Wis.)

Home Ownership

Because of the lack of data on the methods and problems of urban residential development, a study of "Apartment House Increases and Attitudes Toward Home Ownership," has been made by Coleman Woodbury, Research Associate in the Institute for Economic Research, and Associate Professor of Land Economics, Northwestern University. The monograph, published by the Institute, is made up of two sections: Part I, Analysis of the Building Permit Data, based on figures collected and published by the Bureau of Labor Statistics; and Part II, Attitudes Toward Home Ownership and Tenancy, based on a questionnaire sent to representatives of different groups in the metropolitan area of Chicago, 74 pp. $1.00. (Apply to the Institute, 337 E. Chicago Ave., Chicago, Ill.)

Culvert Loads

"Investigation of Loads on Three Cast Iron Culverts Under Rock Fills," by M. G. Spangler, reports the results of a study conducted by the Iowa Engineering Experiment Station in cooperation with the Iowa State Highway Commission and the United States Bureau of Public Roads, 37 pp., illustrated. (Apply to the Station, Iowa State College, Ames, Iowa.)

Highways

The "Report of the Chief of the Bureau of Public Roads" for the fiscal year ended June 30, 1931, describes in 88 pages the extensive projects on which the Federal Government was engaged during that period. 10c. (Apply to the Superintendent of Documents, Washington, D. C.) "Highway Services and Costs" is the subject of Report No. 5 of the New Jersey State Commission to Investigate County and Municipal Taxation and Expenditures. The highway problem in New Jersey is analyzed and recommendations are proposed to correct the major defects of the existing highway policy. 89 pp. (Apply to the Commission, Trenton, N. J.) The "Proceedings of the Seventeenth Annual Road School" held at Purdue University in January, 1931, include the 25 papers which were presented at that time. 126 pp., illustrated. (Apply to the Engineering Extension Dept., Lafayette, Ind.)

Tax Report

The 1930 Annual Report of the New York State Tax Commission is published in a book of 418 pages. Besides statistics, the report includes recommendations for minor changes in the law; laws relating to taxation enacted in 1930; and leading tax decisions during 1930. (Apply to the Commission, Albany, N. Y.)

Airports and Aeronautics

"Airports and Landing Fields," the report of the Airports and Landing Fields Committee of the American Society of Municipal Engineers presented at the Society's annual convention in October, is subtitled: "A Comprehensive Review of All Phases of This Subject, Including Promotion, Public Relationship, Engineering Design and Construction, Equipment and Management." 71 pp., illustrated, but unfortunately lacking a table of contents or index with page numbers indicated. Revisions in the engineering requirements to be met by aircraft in order to be certified as airworthy by the Department of Commerce are incorporated in Aeronautics Bulletin No. 7-A, "Airworthiness Requirements of Air Commerce Regulations for Aircraft," which has just been published by the Aeronautics Branch of the Department, with amendments to January 1, 1932. 99 pp. (Apply to the Aeronautics Branch, Dept. of Commerce, Washington, D. C.)

Water Rates

The purpose of the "Ohio Public Utility Rate Book—Part I: Water Rates and Service," compiled and verified by Ellsworth Wolfsperger and Rex N. Johnson for the Ohio Municipal League, is to "make available for the first time comparative data on rates and services in Ohio cities." Electricity, gas, telephone, heat, and street railway utilities will be taken up separately. 47 pp. $3.00. (Apply to the League, Ohio State University, Columbus, Ohio.)

Rural Fire Departments

"Rural Community Fire Departments," Farmer's Bulletin No. 1667 of the U. S. Department of Agriculture, summarizes the results of a field survey of 80 rural fire departments. One from each of the several types of fire organizations giving service to farms is described "in the hope that any interested community will find at least one type that would suit its conditions." 46 pp., illustrated. 10c. (Apply to the Superintendent of Documents, Washington, D. C.)

Fire Protection

"City Planning and Fire Protection" is discussed by Henry C. Klein, Chairman of the Planning Board, Dobbs Ferry, N. Y., in a 7-page article which has been reprinted from the July number of the National Fire Protection Association *Quarterly*. 10c. (Apply to the Assn., 60 Batterymarch St., Boston, Mass.)

Model Community

An illustrated booklet on "Chatham Village" describes the model housing experiment and demonstration on Mt. Washington, Pittsburgh, being financed by the Buhl Foundation. This self-supporting planned community, "built for the motor age," has been designed "to meet the needs of the family of moderate salary and of cultivated appreciation." 12 pp. (Apply to the Buhl Foundation, Farmers Bank Bldg., Pittsburgh, Pa.)

Railroad Consolidation

The "Report on Consolidation of Railroad Services in Southern New Jersey" submitted by the Board of Public Utility Commissioners to the Governor and Legislature embodies the results of the investigations of Fisk & Roberts, consulting engineers, and their recommendations, which stress the advantages of consolidation. 157 pp. (Apply to Fisk & Roberts, 82 Beaver St., New York.)

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Housing

An exceptionally graphic and photographic description of the disgraceful housing conditions of the less fortunate 50 per cent of our fellow citizens is presented in the February issue of *Fortune*. This forceful 8-page article, entitled "Housing: The Need," is to be followed by others in which it is hoped that constructive suggestions will be offered as to how American cities—and villages, too—can find their way out of the slums. (Address 135 E. 42d St., New York.)

Other Reports Received

COOK COUNTY, ILL.—Annual Report, Retirement Board of the County Employees' Annuity and Benefit Fund, year ending December 31, 1930. 24 pp.

EAST PROVIDENCE, R. I.—Annual Report, Board of Water Commissioners, year ending October 10, 1931. 23 pp.

MASSACHUSETTS.—Annual Report, Division of Housing and Town Planning, Department of Public Welfare, for the year ending November 30, 1931. 10 pp.

MONTREAL, QUE.—Financial Statement and Assessments, year ended December 31, 1930. 112 pages.

PASADENA, CALIF.—Annual Report, Municipal Light and Power Department, 1930-1931. 37 pp.

SALT LAKE CITY, UTAH.—Annual Report, Engineering Department, 1930. 105 pp.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

FEBRUARY 3-5.—TORONTO, ONT. (250)
Engineering Institute of Canada. Annual meeting. Secretary, R. J. Durley, 2050 Mansfield Street, Montreal, Que.

FEBRUARY 4.—RICHMOND, VA.
Virginia State Chamber of Commerce. Annual meeting. Managing Director, LeRoy Hodges, 708 Grace-American Building, Richmond, Va.

FEBRUARY 10-12.—CHICAGO, ILL. (100)
National Paving Brick Association. Annual meeting. Managing Director, G. F. Schlesinger, 1245 National Press Building, Washington, D. C.

FEBRUARY 10-13.—CHICAGO, ILL. (350)
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

FEBRUARY 11.—BOSTON, MASS. (100)
Massachusetts Highway Association. Meeting. Secretary, John M. McCarthy, 318 State House, Boston, Mass.

FEBRUARY 12-13.—COLUMBUS, OHIO. (75)
Ohio Commercial Secretaries Association. Annual meeting. Secretary-Treasurer, Harold R. Cross, Barberton, Ohio.

FEBRUARY 16-18.—ANN ARBOR, MICH. (600)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 16-17.—HARTFORD, CONN. (150)
Connecticut Society of Civil Engineers. Annual meeting. Secretary, C. M. Blair, Box 235, New Haven, Conn.

FEBRUARY 17-19.—ATLANTIC CITY, N. J. (2,000)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary-Treasurer, A. Lee Grover, State Highway Commission of New Jersey, Trenton, N. J.

FEBRUARY 17-19.—ATLANTIC CITY, N. J.
New Jersey Mosquito Extermination Association. Annual convention. Secretary, Dr. Thomas J. Headlee, State Experiment Station, New Brunswick, N. J.

FEBRUARY 19-25.—WASHINGTON, D. C. (10,000)
National Education Association—Department of Superintendence. Annual meeting. Executive Secretary, Sherwood D. Shankland, 1201 16th Street, N. W., Washington, D. C.

FEBRUARY 23-25.—TORONTO, ONT. (1,000)
Ontario Good Roads Association. Annual convention. Address: S. L. Squire, 98 Albany Avenue, Toronto, Ont.

FEBRUARY 25.—NEW YORK.
National Civil Service Reform League. Annual meeting. Secretary, J. Eliot Kaplan, 521 Fifth Avenue, New York.

MARCH 1-4.—WASHINGTON, D. C. (800)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

MARCH 2-4.—MOOSE JAW, SASK. (800)
Saskatchewan Association of Rural Municipalities. Annual convention. Secretary, J. J. McGurran, 407 Kerr Building, Regina, Sask.

MARCH 9-11.—NIAGARA FALLS, ONT. (100)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, Dr. A. E. Berry, Director of Sanitary Engineering, Ontario Parliament Buildings, Toronto, 5, Ont.

MARCH 9-10.—LAFAYETTE, IND.
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

MARCH 10.—CONCORD, N. H. (150)
New Hampshire Good Roads Association. Annual meeting. Secretary, Frank D. Sleeper, Laconia, N. H.

MARCH 17-18.—TRENTON, N. J. (250)
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

MARCH 22-24.—ATLANTA, GA. (200)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square S. W., Atlanta, Ga.

APRIL 11-14.—WASHINGTON, D. C. (1,300)
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

APRIL 11.—NEW YORK. (500)
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, Miss Julia K. Jaffray, 250 West 57th Street, New York.

APRIL 11-15.—STILLWATER, OKLA.
Oklahoma Water and Sewage Conference. Annual Conference. Secretary-Treasurer, H. J. Darcy, State Sanitary Engineer, Oklahoma City, Okla.

APRIL 12-13.—URBANA, ILL. (100)
American Water Works Association—Illinois Section. Annual convention. Secretary, Professor J. J. Doland, University of Illinois, Urbana, Ill.

APRIL 14-16.—JACKSONVILLE, FLA. (100)
Florida Engineering Society. Annual meeting. Secretary, W. W. Fineren, Gainesville, Fla.

APRIL 15-16.—PHILADELPHIA, PA. (250)
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, 3622-24 Locust Street, West Philadelphia, Pa.

APRIL 17-19.—LUFKIN, TEXAS.
East Texas Chamber of Commerce. Annual convention. General Manager, Hubert M. Harrison, Longview, Texas.

APRIL 25-29.—DETROIT, MICH. (600)
National League of Women Voters. Biennial convention. Executive Secretary, Beatrice H. Marsh, 532 17th Street, N. W., Washington, D. C.

APRIL 27-29.—WASHINGTON, D. C. (200)
American Institute of Architects. Annual convention. Secretary, Frank C. Baldwin, The Octagon, Washington, D. C.

MAY 2-6.—MEMPHIS, TENN. (1,500)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 9-11.—SAN ANTONIO, TEXAS.
City Marshals and Chiefs of Police Union of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

MAY 9-12.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 16-20.—SAN FRANCISCO, CALIF. (3,000)
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street, N. W., Washington, D. C.

MAY 23, WEEK OF.—LONDON, ENGLAND.
International Congress of Local Authorities. (Followed by tours in England and Scotland during the next two weeks.) General Secretary, E. Vinck, Rue de la Régence, Brussels, Belgium; General Secretary of the British Organization, G. Montagu Harris, Ministry of Health, Whitehall, London, S. W. 1. American inquiries may be addressed to Luther Gulick, Director, National Institute of Public Administration, 261 Broadway, New York.

MAY 25-27.—MENASHA, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

MAY 25-28.—PHILADELPHIA, PA. (250)
Pennsylvania State Association of Township Commissioners. Annual convention. Secretary-Treasurer, H. A. Fritschman, Eagle and Darby Roads, Upper Darby, Pa.

JUNE 9-18.—SEATTLE, WASH. (3,000)
General Federation of Women's Clubs. Biennial convention. Manager, Mrs. Clinton Doggett, Research and Club Service, 1734 N Street N. W., Washington, D. C.

JUNE 13-16.—LOS ANGELES, CALIF.
National Conference on City Planning. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

JUNE 14-16.—GRAND RAPIDS, MICH.
Michigan State Fire Chiefs' Association. Annual convention. Secretary, George F. Dansbury, Grosse Pointe Farms, Mich.

JUNE 20-24.—CLEVELAND, OHIO. (550)
American Institute of Electrical Engineers. Annual summer convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JUNE 27-JULY 1.—LAKE OF BAYS, ONT. (500)
American Society of Mechanical Engineers. Semi annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

JULY 23-29.—LOS ANGELES, CALIF.
International Recreation Congress and annual meeting of the National Recreation Association. First International Congress. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

JULY 30-AUGUST 6.—LOS ANGELES, CALIF.
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, Whitney Bank Building, New Orleans, La.

SEPTEMBER 26, WEEK OF.—SWAMPSCOTT, MASS.
Illuminating Engineering Society. Annual convention. General Secretary, E. H. Hobbie, 29 West 39th Street, New York.

SEPTEMBER 28-OCTOBER 1.—PITTSBURGH, PA. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 3-7.—WASHINGTON, D. C. (5,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 24-27.—WASHINGTON, D. C.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

OCTOBER 31-NOVEMBER 2.—WINSTON-SALEM, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary, H. G. Baity, Associate Professor, School of Engineering, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 7-11.—NEW ORLEANS, LA.
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

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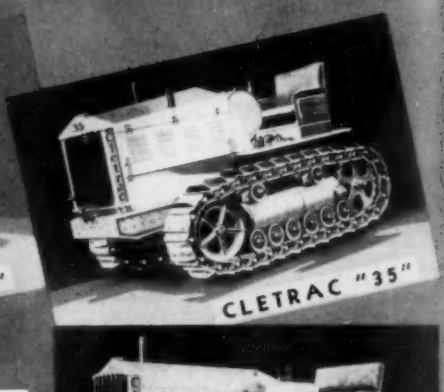

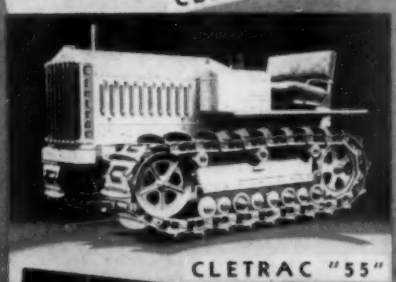

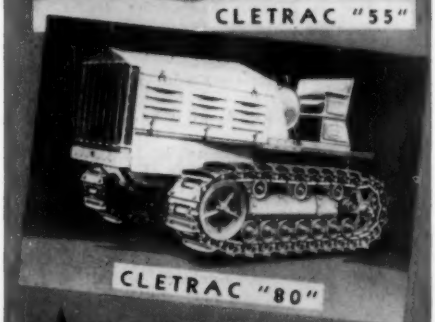

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IT'S that *extra* performance which Cletrac Crawlers are able to put into a job that makes them outstanding favorites with public officials, engineers and contractors the world over. They have the extra power, extra speed and extra capacity that never fail to show up in extra savings and earnings at the end of a job or a season.

That is why we say, "Turn to the Cletrac line when you need power." It is made up of dependable, capable units that are built for the heavy loads and tough going of your kind of work. Five Cletrac models ranging from 15 to 80 h. p. are yours to choose from — five different sizes to match the power requirements of any equipment or any job.

Let us give you the complete story of these fast, sure-footed, capable crawlers and show you what they offer in efficient, low-cost tractor service. See your local Cletrac distributor— or write direct for full information.

★NEW! —CLETRAC "25"

The new addition to Cletrac's 1932 power line-up is CLETRAC *"25". It is a heavy-duty, six cylinder unit that incorporates all of the famous features of Cletrac design and performance which have made these tractors outstanding. See the new "25" at your Cletrac distributor's — or write for full information.*

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A High-Duty Truck-Mounted Power Tree Sprayer

A large-capacity park sprayer which has met with exceptional favor has recently been built by the "Friend" Manufacturing Co., Gasport, N. Y. This sprayer was demonstrated at the National Shade Tree Convention at Yonkers, N. Y. It was built to meet a special need—that of having the ability to thoroughly spray the larger trees in city parks. Two "Friend" model AXC pumps are used, driven by two separate power take-offs operated by the driver from within the cab. The illustration shows the equipment mounted on an A-4 2-ton International truck, but it can be furnished for power take-off from any standard truck of sufficient power. The pumps each have a capacity of 45 gallons per minute, giving a combined capacity of 90 gallons per minute when operating at 700 pounds pressure.

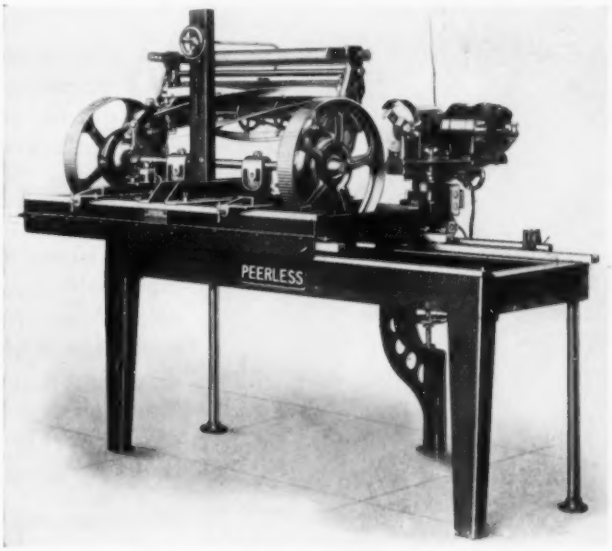
An important phase of the construction of this outfit is that either or both pumps can be used as desired. This is accomplished by having each power take-off controlled independently by transmission levers in the cab. The pumps are fully enclosed, lubricated by Alemite and by an oil bath, are easily accessible and adjustable, and are each four-cylinder units, making a combined eight-cylinder pump which easily provides the pressures and capacities desired.

In the illustration the height of the tree and the effectiveness of the spray may be judged by comparison with the man in the foreground. The effectiveness of the spray is easily seen in spite of the strong wind which was blowing.

THE NEW HIGH-DUTY FRIEND SPRAYER IN ACTION IN A HIGH WIND

A New Power Mower Sharpener and Reconditioner

A new mower sharpener embodying unique features, and known as the Peerless Model D, has been announced by the Fate-Root-Heath Co., Plymouth, O. This machine grinds all makes and types of power-driven, fairway, putting-green and hand mowers without removing the mower wheels or reel knives. It grinds the blades with the proper clearance behind the cutting edge, makes the mower run easily and lengthens the life of the mower. It is accurate and fast.



THE NEW MODEL D PEERLESS MOWER SHARPENER

The carriage is a one-piece heavy casting with renewable V-tracks which ride on 15/16-inch steel balls. The carriage has a travel of 42 inches and is provided with adjustable stops. The bed is also a one-piece box section heavy casting with renewable hard iron tracks. The carriage, running on steel balls, requires only a slight pressure for feeding the work along the grinding wheel, eliminating all feed mechanism. The grinding head is attached to a vertical post and carries a 6-inch grinding wheel, mounted on ball bearings, driven by a 1/3-hp. motor by means of a V-belt.

A reconditioner attachment can be furnished for "lapping in" putting-green mowers after they have been ground, or for reconditioning slightly dull ones, with grinding compound or emery paste. This attachment can be quickly clamped to the carriage of the sharpener by means of two clamps. The attachment consists of a belt-driven geared speed-reducer unit, an adjustable roller support to raise and lower the reel shaft, two driving couplers and five pounds of grinding compound. The motor unit is mounted on a sliding base which gives a horizontal adjustment and drives the reel knives at the proper speed for lapping in.

A New Non-Skid Asphalt Pavement

A new low-cost pavement with non-skid qualities has recently been produced by Warren Brothers Roads Co., Boston, Mass. Fundamentally, this new Penolithic pavement is based upon the demonstrated fact that asphalt will adhere very much more strongly to stone that has been coated with a non-volatile oil than it will to unoiled stone. The asphalt will also penetrate the stone aggregate of the road much more completely and cover the surfaces of oiled stone much more thoroughly than when the stones are unoiled. The reason for this is that commercial deliveries of stone unavoidably contain dust, with the result that in past practices the asphalt cement when applied to the stone has adhered to the dust film around the stone and not to the stone itself. As a consequence, the asphalt could be quite readily stripped from the stones, resulting in variable durability of the structure. Moisture also prevents the complete adherence of the asphalt to the stone.

As a result of the demonstration of the new principle combined with the method by which the new materials are selected and laid, a pavement reported to be durable and inexpensive with a superior structural bond and strength has been announced. The process also insures a surface which strongly tends to prevent skidding. The newly completed Cadillac mountain highway in Acadia National Park, Mt. Desert Island, Me., is built of native pink granite and surfaced with Penolithic, partially for its non-skid qualities. This highway will be formally opened in July, 1932.

Leadite Moves Home Office

The Leadite Company has announced the removal of its offices from the Land Title Building to the Girard Trust Company Building, Philadelphia, Pa.

STOP THESE ACCIDENTS!

When Pavements Are Icy

WHAT is safe driving speed on an ice covered pavement? Sometimes brakes are useless, tires get no grip at all, steering wheels turn but cars don't. Which driver is to blame when cars crash under these conditions?

Modern traffic demands ice control. Folks must drive. Trucks must move merchandise. Pavements must be made safe for driving at ordinary speeds, all the time. They can be made safe if ice is covered at once with a mixture of Calcium Chloride and coarse sand, cinders or other good tractive material. The sand or cinders alone are not enough. Sometimes they're brushed off in a few minutes. Then curves and stop corners are more dangerous than ever.

When you mix Calcium Chloride with the sand you put in an active ice removal agent that melts the particles of grit right into the ice so that tires hold. Even if the material freezes, it fixes the grit into the ice, makes driving safe.

Full data on Ice Control with Calcium Chloride may be had by writing any of the addresses below.

CALCIUM CHLORIDE ASSOCIATION

SOLVAY SALES CORPORATION
61 Broadway, New York City

THE DOW CHEMICAL COMPANY
Midland, Michigan

MICHIGAN ALKALI COMPANY
10 East 40th St., New York City

THE COLUMBIA ALKALI CORPORATION
Barberton, Ohio

CALCIUM CHLORIDE FOR ICE CONTROL

THE NEW CATERPILLAR MOWER

A Motor Scythe for Tractor Mounting

A new mower for attachment to Model Ten and Fifteen Caterpillar tractors has been announced by the Caterpillar Tractor Co., Peoria, Ill. This sturdy and strong mower has a double-acting automatic safety device so that if an obstruction gets between the sickle section and the guard, stopping the movement of the cutter bar, the power is immediately released by a snap clutch. Should the forward motion of the sickle bar be prevented by its striking an obstruction, the sickle bar pull rod automatically disengages, releasing the cutter bar, which may then swing completely around to the rear of the tractor. The snap clutch is mechanically released by a cam and lever at the same time. The sickle bar is brought back into normal cutting position and the ball of the pull rod snaps into its socket.

Longer life and easier running of moving parts is assured by the pitman crank's being placed in such position that the pitman rod runs in almost the same plane as the cutter bar. The extra-heavy 7-foot length steel sickle bar is sufficiently strong to withstand the heaviest type of mowing service along road shoulders or in cutting the rough on a golf course.

Heavy balanced springs insure quick and easy lifting of the sickle bar on turns. The pitch of the sickle bar is controlled from the operator's seat by a conveniently placed lever. Both ends of the pitman drive shaft are carried on adjustable tapered roller bearings. The mower is flexible, both at the point of attachment to the tractor and also at the heel of the sickle bar. The motor drive may be disengaged by merely shifting the power take-off throw-out lever. The heel and complete sickle bar is fully, quickly and easily lifted from the ground by a lever conveniently placed at the operator's left hand. The mower may be detached from the tractor, leaving that machine free for other work, by merely removing four bolts and uncoupling the drive chain. For moving from job to job, the mower is transported with the sickle bar in a vertical position, it being firmly locked to the tractor and provided with ample ground clearance.

A Road and Street Sweeper Mounted on Light-Duty Trucks

A new road and street sweeper for attaching to light-duty trucks of about 1½-ton capacity has recently been placed on the market by the Willett Manufacturing Co., Grand Rapids, Mich. The power for operating the sweeper is taken from the front end of the truck motor, and, once the installation is made, the entire sweeper can be either disconnected or re-attached in 15 minutes, so that the truck can also be used for all other purposes when not actually required for the sweeping of streets. The steering of the sweeper wheels is controlled by the steering wheel of the truck and is properly synchronized.

This street and road sweeper is designed so that the broom maintains a uniform contact with the street surface whether doing light sweeping or heavy sweeping, and regardless of the up and down motion of the truck wheels or sweeper wheels in riding over variations in the road surface. The controls for the operation of the sweeper are conveniently located close to the driver in the cab. While operating the broom, the driver can quickly vary the degree of pressure of the sweeper on the road surface.

The weight of the 60-gallon water tank immediately behind the sweeper proper is supported by the sweeper wheels. The flow of water to the sprinkler nozzles is controlled by a gear pump which is driven from the main drive shaft of the sweeper and which pumps the water only when the broom is being rotated.

This sweeper is so designed that very little weight, and no shock, is sustained by the front axle of the truck, as the sweeper frame is so designed that there is a connecting link which joins up to the frame of the truck and which keeps the sweeper always in parallel with the truck chassis. The sweeper has proved effective for all kinds of street sweeping, including snow removal.

A Horizontal Setting for Meters on Vertical Pipes

A meter coupling which saves the cost of ordinary meter couplings and pipe fittings and will provide all water passages of copper or bronze has been announced by the Ford Meter Box Co., Wabash, Ind. The special feature of the Ford Copperhorn is that it permits setting meters in a horizontal position on vertical pipes, and at an elevation where they are out of the way of cellar dirt and dust and are easily found by the meter reader. The arms of the Copperhorn are oversize copper tubes with smooth sweeping bends terminating in bronze coupling nuts which are attached direct to the meter spuds. To install the Copperhorns, it is only necessary to cut 4 inches out of the vertical pipe, thread the pipe and then set in the Copperhorn, using the bronze unions. The bronze union swivels pack off direct against the flared end of the copper tubing in the coupling. The union nuts and body piece are cadmium plated.

THE NEW FORD COPPERHORN METER COUPLING

New G. E. Publicity Manager

Chester H. Lang, formerly Assistant Manager of the Publicity Department and then Comptroller of the Budget of the General Electric Co., Schenectady, N. Y., has been appointed Manager of the Publicity Department, to succeed Martin P. Rice, who retired at the close of 1931 after more than 37 years of service with the company.

Lock Joint Pipe on the Pacific Coast

The Lock Joint Pipe Co., Ampere, N. J., has announced an arrangement with the American Concrete & Steel Pipe Co., Los Angeles, Calif., whereby the latter company will manufacture and install Lock Joint steel cylinder reinforced concrete pipe west of the Rocky Mountains and in Texas.

The American Concrete & Steel Pipe Co. has done a large volume of work in the West in the manufacture of reinforced concrete pressure pipe and in the construction of pressure pipe lines for water supply as well as in the manufacture of sewer and culvert pipes.

THE WILLETT SWEEPER MOUNTED ON A FORD TRUCK

ANNOUNCING

A NEW

TELETYPEWRITER SERVICE

THE BELL SYSTEM offers to the public a new Teletypewriter Service. Any subscriber to this service may be connected, through the teletypewriter "central," to any other subscriber, whether he be around the corner or across the continent. Subscribers can type back and forth by wire, for short or long periods, just as they now hold conversations by telephone.

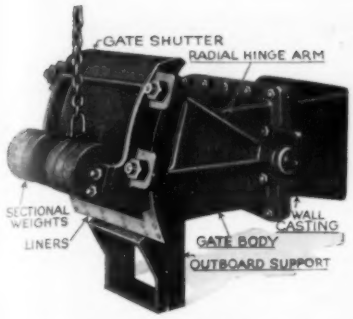
This important development for the business world parallels the other progress which is constantly being made in the telephone art.

Messages, inquiries, reports — typed in one office — are instantly and accurately reproduced on the other subscriber's teletypewriter. Typewritten copies made by both sending and receiving machines are available for permanent records. The principal feature of this new service, which distinguishes it from existing private line teletypewriter service, is that any subscriber may ask for any other subscriber and be connected immediately.

Further information about this new development in nation-wide communication will be furnished gladly by your local Bell Telephone Business Office.

Teletypewriter Service provides two-way communication.
Speed of connection is as fast as telephone service.
A typewritten record, one or more copies, is produced simultaneously by both sending and receiving machines.
Material transmitted may be recorded on forms if desired.
Teletypewriters are like ordinary typewriters in appearance.
Teletypewriters can be operated by any one who can operate a typewriter.
You can use Teletypewriter Service any time you need it.
A most economical form of record communication.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY



THE GATE ASSEMBLY OF THE AUTOMATIC SEWAGE FLOW REGULATOR

Automatic Sewage Regulators

The automatic sewage regulators made by Brown and Brown, Inc., Lima, Ohio, consist of a gate assembly, a float assembly, and a transmission assembly. The regulator gate is of the reverse tainter type and mainly comprises a wall casting, a gate body and a gate shutter. The bodies and shutters are regularly faced with non-corrosive metal to insure freedom from pitting. The gate body is provided with an outboard support which also serves as a stop to limit the downward travel of the gate shutter. The lifting chain is attached to the gate shutter at its exact center of gravity.

The float unit comprises float, float guides, base plate and travel limit blocks. The float is a one-piece grey iron casting with cover plate, to which the transmission chain is attached. The guide shoes are cast integrally with the float casting and engage vertical guides of extra-strong wrought iron pipe. Cast iron collars are applied to the vertical guides to serve as float travel limit blocks.

The transmission assembly is composed of a shaft, sprocket wheels and chains, counterweights and pendants, shaft bearings, supporting beams and wall brackets. These gates with the float control automatically regulate the quantity of sewage discharged into any given channel or basin.

Removing Tastes and Odors in Water Supplies

The removal of tastes and odors from domestic water supplies has long been a serious problem confronting water-works operators. The appearance of activated carbon within the last two years has opened a field of investigation for water works which has been surprising in its development. Experiments have shown that activated carbon in the form of a fine powder approximating 200 mesh is more effective than the early granular form of this material. Nuchar, the activated carbon product of Industrial Chemical Sales Co., Inc., 230 Park Avenue, New York, has a great adsorbing power and serves as a gravitating point for the minute impurities present in water and responsible for additional tastes and odors. These impurities are physically adsorbed and retained by the carbon particles.

Nuchar is fed as a dry powder at a predetermined rate through an ordinary dry feed machine, equipped with an ejector which effectively distributes the water-carbon suspension. The application is made at one or more points prior to sand filtration. The exact point of application is determined by experiment under conditions existing at the plant. This activated carbon is so inexpensive that it can be applied to raw or settled water and later discarded with the sludge, removed from the basins, or disposed of in the wash. The amount needed varies with conditions existing in individual water works. In several plants the addition of 10 to 20 pounds of Nuchar per million gallons to raw waters has proved satisfactory. In other cases smaller amounts, 10 pounds or less per million gallons, applied to the coagulated and settled water just ahead of filtration, have given equally good results. The finely powdered consistency of Nuchar insures thorough dispersion through the water under treatment. It settles out very slowly. When applied just ahead of the filters, it produces a cumulative deposit of carbon on the surface of the sand. Thus it does its work twice, once in suspension and again in the filter bed. Filter washing removes the carbon blanket as often as may be necessary. Where primary and secondary coagulation basins are available, Nuchar may be applied at the entrance to the secondary basin. A relatively long period of contact between impurities and carbon is thus provided and the carbon avoids the disadvantages of having to combat the heavy load of impurities removed in the primary basin by coagulation and prechlorination. Under this plan less carbon will reach the filters, the beds will clog less frequently, and more water will pass between filter washings.

A New Well Screen

An entirely new screen which carries still farther the principle of maximum intake opening and in addition embodies a new principle, namely, creating each screen as a tailor-made product to fit the exact requirements of each well, has been announced by Edward E. Johnson, Inc., 2304 Long Avenue., St. Paul, Minn. The screens are made of the proper metal to meet each water condition, as well as with the proper size of slot to fit any sand condition.

Thirty years ago Edward E. Johnson announced the continuous inlet slot, which took into consideration the great influence which the area of intake in the screen has upon the capacity of the well. The present screen is a distinct step forward. The four outstanding features of the new patented screen are: (1) it is constructed entirely of one metal with a choice between several different kinds of metal to meet the exact requirements of each well; (2) it is welded by a patented Electric-Master-Weld method, which maintains almost the entire strength of the original parts and builds the screen as one completely fused unit of maximum strength without solder or locked joints to corrode or break loose; (3) it has an area of intake opening which far surpasses that of previous screens; (4) it possesses a sharp outer slot which widens toward the inside and has a direct opening into the screen.

CATERPILLAR TEN WITH THOMPSON FAIRFAX DISTRIBUTOR PLANTING GRASS SEED ON THE DENVER MUNICIPAL AIRPORT

The field is a square section and the Caterpillar is used on the entire port

-'way back in 1888

—a year famous for the big blizzard—the defeat of Grover Cleveland for the presidency—the shutting off of Chinese immigration—and the re-surfacing of Bryden Road, Parsons Avenue to Twenty-second St., Columbus, Ohio, with Trinidad Sheet Asphalt.

* * * *

That pavement was put down just forty-four years ago and the lake asphalt which was used to re-surface the old cobblestone pavement is still in service. Here and there you'll find a patch but it is a truly remarkable testimonial to Trinidad Lake Asphalt to find that this street has given such long service with comparatively low maintenance costs.

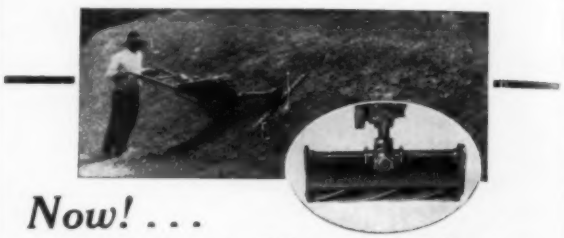
Bryden Road has been subjected to increasingly heavy traffic every year. Just to give you an idea of the traffic passing over this street it will be interesting to note that a count taken recently showed that more than 11,000 motor cars and trucks passed the intersection of Bryden Road and Parsons Ave. in thirteen hours.

You can get long-life, low maintenance streets by specifying Trinidad Lake Asphalt . . . the asphalt that is different . . . the only asphalt with a naturally occurring colloidal filler which is a contributing factor to the long life of millions of square yards of Trinidad Lake Asphalt streets and roads throughout the United States and foreign countries.

Write for complete information regarding the remarkable record of Trinidad Lake Asphalt pavements.

THE BARBER ASPHALT COMPANY
PHILADELPHIA
NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO

TRINIDAD
NATIVE LAKE
ASPHALT



Now! . . .

A 2-in-1 Mower that does ALL your mowing

. . . works where others can't!

NO wonder the GRAVELY Dual Type MOWER is preferred by up-to-the-minute Park, Cemetery and Playground keepers everywhere: **It is TWO Mowers in One**—both Sickle and Rotary types, saving 50 per cent of your hand-trimming and 25 per cent of your time, as well as improving the general appearance of your grounds. . . . The Sickle Bar, backed by powerful traction, mows the tallest weeds or grass over roughest ground or steepest hillsides without a skip. Patented Swivel Action permits it to follow contour of ground, even to 45-degree angle. Weight perfectly balanced on single wheel: it won't topple over, never slips, and affords powerful pivotal leverage for easy handling. Engine-driven Rotary Mower, interchangeable with sickle bar, does perfect job under ordinary conditions. With tools out in front, you can nose into narrow corners and right up against trees and other obstacles —places you cannot touch with ordinary mower. Cuts 39-inch swath. . . . A practical machine that has proved its superiority in this and 52 foreign countries. Your request for Free Booklet will bring interesting FACTS.

GRAVELY MOTOR PLOW & CULT. CO.
Box 107, Dunbar, W. Va.

The GRAVELY GARDEN TRACTOR & MOWER
A MIDGET IN SIZE - A GIANT IN POWER!

HICKORY FIBER for ROTARY SNOW BROOMS STREET SWEEPERS HAND BROOMS

HUNTSVILLE Hickory Fiber for all types of brooms is an unconditionally guaranteed product that will give consistent and economical service over long periods of time—sweeps clean the roughest pavements—handles the heaviest refuse with ease. Each fiber is a live, springy, flexible broom filler made from the best selected green hickory, thoroughly cured, and rigorously inspected. It will pay you to investigate, write today.

The Huntsville "Trade Mark" on every bale is your guarantee. Look for it.

FAULTLESS FIBER HUNTSVILLE HICKORY FOR STREET SWEEPERS

Write today for the Booklet "The Story of Huntsville Hickory"

FRANK H. FORD, President

HUNTSVILLE
FIBER & VENEER WORKS
HUNTSVILLE ALABAMA

THE NEEDHAM POSITIVE PRESSURE BLOWER

Positive Pressure Blowers for Sewage Work

A positive pressure blower which produces pressure s up to 10 pounds and which is particularly adaptable for activated sludge sewage plants, known as the Needham blower, is manufactured by Pneumatic Tube Supply Co., Plainfield, N. J. This blower operates on the well-known and long-established principle of trapping the air between the impellers of enclosed rotating units. The Needham blower uses vertical impellers because the horizontal type gave trouble from oil or grease in the bearings and gears working into the compression chamber, thus mixing with the air and being forced out into the line. The wear on the bearings of the horizontal type allows the impellers to drop out of alignment, hit together and also wear the air chamber owing to the rubbing action. This made the horizontal blower noisy and aggravated oil leakage. By placing the impeller shafts vertically, the bearings and gears can be run in a bath of oil. This allows the use of ball or roller bearings, which greatly reduces friction, lengthens the bearing life and preserves the alignment of the impellers. The Needham design blower uses a popular taper roller bearing on both impeller shafts and worm shaft to take the thrust in either direction. This type of bearing is the only kind that develops no side play as it wears. These bearings are housed in retainers that are adjustable outside the blower housing, thus removing the necessity of dismantling the blower to compensate for wear. By this method the life of the bearings is prolonged. The vertical shaft permits worm drive to both shafts at the same distance from the air load. This eliminates the slight twist of the shafts and consequent knocking of the impellers sometimes found in the horizontal type blowers where the timing gears are placed at the opposite end of the blower from the motor coupling or pulley. The worm drive gives the necessary speed reduction, thus eliminating belts, chains and gears. With this particular design, the top cover can be easily removed for the inspection of the impellers, and, if necessary, the impellers themselves may be removed without tearing down the blower. Foreign substances sucked into the blower by accident can be readily cleaned out. The vertical type with worm drive makes possible a shorter blowing unit, thus saving floor space. The clearances can be reduced, thus permitting higher pressures and greater efficiency.

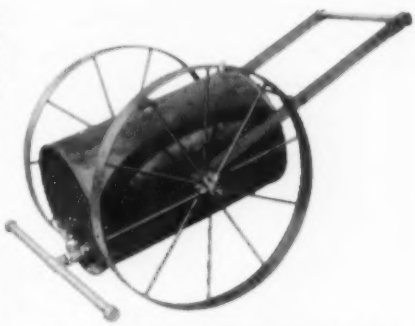
Needham blowers are made in sizes from 4½ x 7-inch, displacing 60 cubic feet of free air per minute at 1,200 r.p.m., up to 21 x 24-inch units, displacing 2,900 cubic feet of free air at 560 r.p.m., and larger sizes to order. The horsepower of the motor required depends upon the volume and pressure of air desired on the delivery side.

Effective Rubber Traffic Markers

A flexible rubber panel 22 inches long and standing upright in the pavement, 7 inches high, with letters of Federal yellow rubber vulcanized into the black rubber background, describes the visible portion of the Standard Sure-Stop traffic marker manufactured by The General Tire & Rubber Co., Akron, Ohio. This rubber panel is mounted in a cleated base of creosoted wood with brass anchor plates entirely enclosed in a rust-proof aluminum case. In installing the unit, a slot from 4 to 5 inches wide and 26 inches long is cut through the top layer of the pavement without disturbing the paving foundation. The marker is inserted in this slot and asphalt or concrete poured around it, which when set will hold the signal in place. When a sign has worn out, a refill consisting of the rubber part with the creosoted wood base attached may be ordered. To replace the marker, the nut at the end of the base is unscrewed, the small top plate removed and the old marker lifted out. When the new marker is inserted in the aluminum case, the top plate is replaced at each end and the nut screwed down. The operation takes but a few minutes.

The effectiveness of these signs, which can be had in practically every standard wording, is due to the fact that they stand upright in the path of travel and are located in the direct line of driving vision and in the focus of headlights, and are easily read at 500 feet in the daytime and 250 feet at night.

A "SURE-STOP" TRAFFIC MARKER SET IN THE PAVEMENT



THE DOLGE STEEL SPRINKLING CART FOR WEED KILLER

You Can Defeat Weeds with Chemicals, Not Hoes

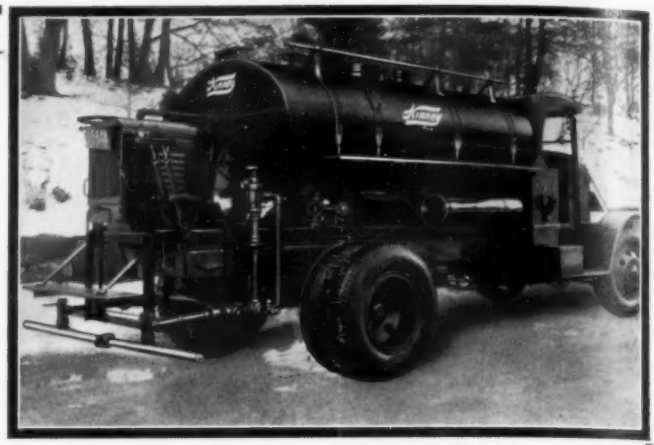
Many thousands of hoes have been completely worn out, hundreds of thousands of backs lamed in hacking away at weeds in gutters, drives, and walks, only to have the weeds come up and flourish more profusely because the roots were not removed. Dolge weed-killer, diluted one gallon of the chemical to 40 of water, covers 1,250 square feet of ground, penetrates the roots of the weeds, and destroys them. Applied in the spring and summer, Dolge weed-killer puts an end to the weed problem for the entire season. Applied in the fall, it destroys the seeds and simplifies the problem for the following spring.

For deep-rooted weeds Dolge weed-killer diluted one part to 20, destroys tough vegetation, such as poison ivy, Canadian thistle, wild grape, wild carrot, heavy Bermuda, nut grass, wire grass, burdocks and similar plants.

The C. B. Dolge Co., Westport, Conn., also makes the Dolge steel sprinkling cart, which is particularly adapted for covering large areas with the Dolge weed-killer. It holds 30 gallons of the ready-to-apply solution, released through the sprinkling boom, which is placed close to the ground, giving ready control of the chemical and keeping it off the bordering grass. The flow of the solution from the cart to the sprinkling boom is controlled by a faucet, as shown in the illustration. The sprinkling boom can be regulated to desired width.

NOW A COMPLETE, ALL-PURPOSE DISTRIBUTOR KINNEY SUPER-DISTRIBUTOR

Maximum Speed and Volume
Lowest Operating Cost



A modern distributor for modern highways, the new KINNEY SUPER-DISTRIBUTOR is guaranteed to heat and efficiently apply all grades of asphalts, tars, road oils, cut backs and emulsions without changing their chemical composition. A big, sturdy but simple machine, it is backed by 20 years of successful distributor manufacture.

Self-Loading Self-Heating

Fast, simple, economical, the KINNEY SUPER-DISTRIBUTOR is self-loading, self-heating with fully controlled pressure, volume and temperature.

Equipped with KINNEY Jacketed Pump, KINNEY Heating and Circulating System, Spraybars and Nozzles.

Send for complete catalog

Kinney
TRADE MARK REG.

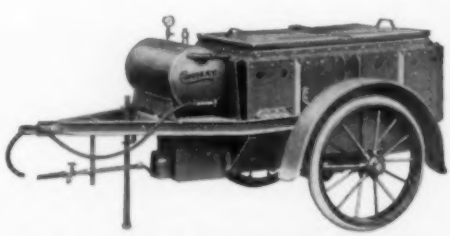
KINNEY MANUFACTURING CO., BOSTON, MASS.

NEW YORK CHICAGO KANSAS CITY PHILADELPHIA SAN FRANCISCO HOUSTON LOS ANGELES

dependable performance—in spite of the abuse of heavy service

Thousands of Connery Kettles in use throughout the country testify to the highly satisfactory service they are rendering. Ruggedly built to withstand the abuse of heavy service, they can be counted on for a long life of reliable performance. Modern in every essential, with quality construction a "must" consideration in their manufacture, Connery Kettles provide a complete outfit to economically handle the toughest job.

Style BB-3 Trailer Heater, 300 gallons



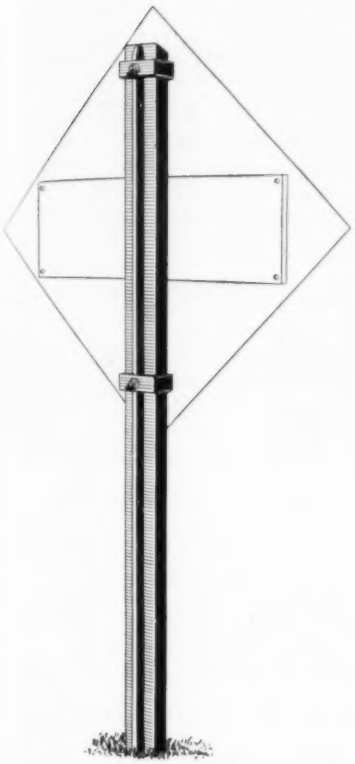
Style "J" Oil Burning Kettle made in 60, 85, 110 and 165-gallon sizes

Connery Kettles are available in all types and sizes to meet your particular requirements. In addition we manufacture a full line of pouring pots, hand-spraying attachments, tool heaters, oil burners, torches, lead melting heaters, tanks, etc.

Write today for our little "Blue Book" illustrating our complete line

CONNERY & CO., Inc.

4000 N. Second Street
PHILADELPHIA, PA.



THE TOLEDO POST FOR BUTTON-TYPE REFLECTOR

A Steel Road Sign Post That Stays Put

A new type of post for mounting button-type reflector signs has been developed by the Toledo Pressed Steel Co., Toledo, Ohio. The post is 7 feet long, formed from 13-gage steel channel section, with a pressed stiffening rib. The bottom end is formed for driving into the ground, or it may be set in concrete. Heavy steel U-clips are welded to the post at the proper points to accommodate standard spacing of bolt holes in signs. Bolts introduced through the sign pass through the post and the clip. The points of each clip project beyond the plane of the channel a sufficient distance to give clearance to the "button box" containing the reflecting portion of the sign. Thus the sign has a two-point contact, is rigidly attached, and is not distorted. The assembled sign cannot be twisted in the ground, is strong enough to prevent its being bent permanently, but with a degree of resilience enabling it to withstand a severe blow without injury to the sign or the post.

A Complete New Method of Proportioning Concrete by Weight

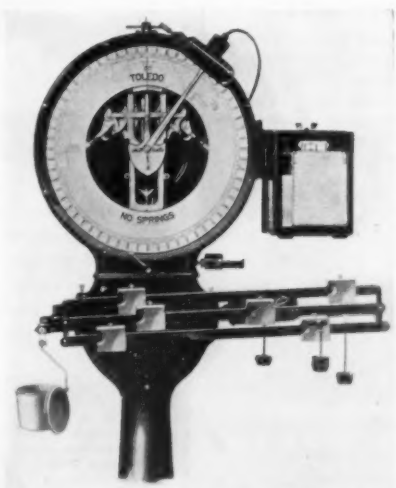
After several years of investigation, the Toledo Scale Co., Concrete Aggregate Division, 934 H Street, N. W., Washington, D. C., has announced the Toledo method of proportioning concrete by weight, using the well-known Toledo springless scale, with certain accessories for moisture determination and compensation, electric cut-off of a mechanically operated gage, and special illumination of the scales to facilitate their use day or night.

The Toledo Determination Auto-Gage is complete equipment for the determination of the specific gravity, percentage of surface moisture, sieve analysis and absorption by bone-dry aggregates. It consists of a Toledo full-floating double pendulum indicating mechanism supported by a column. The patented dial is specially designed for testing aggregates. All materials tested are placed in the container or bucket which is suspended from the lever extending to the left of the column, and the reading is properly indicated on the large dial of the gage.

When the Compensation Auto-Gage is added to this mechanism, the contractor is in a position to produce batches of concrete with definite make-up and strength characteristics. The machine illustrated shows how these devices are built for straight weighing operation on three ingredients entering into the mix and for weighing and compensating for moisture in three additional ingredients. The illustration shows a machine equipped with a graphic recorder and an electrical cut-off device. The graphic recorder produces a permanent ink record which is valuable for inspection purposes, inasmuch as it tells exactly how much of each material was used and what corrections or compensations were made for moisture. The cut-off device permits the scale to be operated electrically, so that the feed of materials may be shut off automatically, thus eliminating a large part of the errors in weighing that are due to the human element.

When used as a testing device, the materials are placed in the bucket or container shown suspended at the left side of the column. For weighing and compensating for moisture, the materials going into the batch are dumped into hoppers or weigh bins, which are supported by a system of scale levers and connected to the indicating mechanism through a steelyard rod extending down through the scale indicating mechanism supporting column.

The indicating device consists of a Toledo full-floating double pendulum indicating mechanism supported by a column. The dial is especially designed for testing and compensating for moisture in connection with concrete aggregates. All the dial readings are clearly indicated on the plainly printed dial surface.



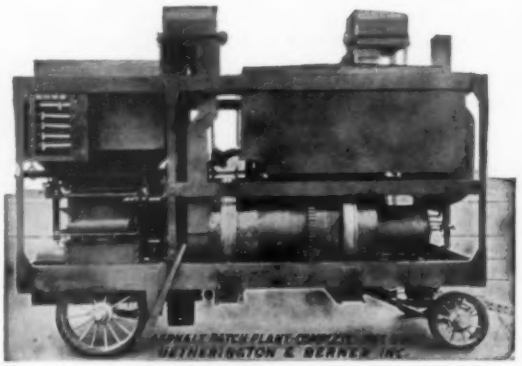
THE TOLEDO DETERMINATION AND COMPENSATION AUTO-GAGE

METHOD OF USING THE ALLWEILER HYDRANT PUMP

A Fire Hydrant Pump

Fire hydrants are built with drains so that any water remaining in the barrel will drain out and prevent freezing of the valve in winter. At times, however, fire hydrant barrels do become flooded from some exterior cause such as the filling-up of the drain below the barrel. To facilitate the drainage of hydrants which have become flooded and to prevent the possibility of freezing, the Interstate Equipment Corporation, 25 Church Street, New York, is marketing the Allweiler fire hydrant pump, which attaches to the top of the stem of the valve, where it is held with one hand while the other actuates the pump. It has a quadruple wing type iron body with machined brass inner parts which are free from leather or rubber valves or flappers.

This hydrant pump is equipped with 8 feet of high-grade hose and a discharge elbow in addition to the bracket mount. One of these pumps in each fire station makes it possible for the inspection crew during the winter to pump out any hydrant which is found flooded and thus prevent damage to the hydrant which will render the expensive fire-fighting equipment useless. All hydrants should be inspected and pumped if necessary before cold weather starts and after use during the winter, to insure their readiness to serve at all times.



A Real Asphalt Patch Plant

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

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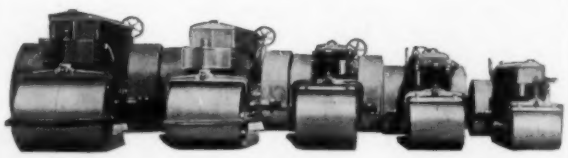

The Buffalo-Springfield Roller line covers an exceptionally wide range of models and sizes. Whether for the heavy compaction demanded in the construction and maintenance of municipal streets, or for light compression work in public parks, on tennis courts, etc., there is a Buffalo-Springfield model to do it to the best advantage.

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THE BUFFALO-SPRINGFIELD ROLLER CO.

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WHAT IS CLAIMED TO BE THE GREATEST VOLUME OF WATER EVER PUMPED AT DENVER, WHERE 18 PER CENT EFFICIENCY IS LOST BECAUSE OF HIGH ALTITUDE, WAS DELIVERED BY THE AMERICAN-LA FRANCE V-12 IN A PUMPING DEMONSTRATION AT THE DENVER DEPARTMENT TESTING PLATFORM AT BERKELEY LAKE

Motor Pumper Makes Coast-to-Coast Tour

When Glen Parrish, engineer in charge, drove his American-LaFrance V-12 motor pumper into San Francisco on November 7, 1931, the speedometer read exactly 15,101 miles, the mileage covered in a trip across the continent with a 1,000-gallon Metropolitan motor fire apparatus powered by a V-type 12-cylinder engine, all made by American-LaFrance and Foamite Corporation, Elmira, N. Y.

Starting at Boston, Mass., on June 26, Parrish began what is believed to be the first coast-to-coast tour ever made by one man driving a piece of motor fire apparatus.

The trip through the twenty-four states of Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Ohio, Indiana, Illinois, Missouri, Kansas, Nebraska, Iowa, Wisconsin, Minnesota, Michigan, Arkansas, Texas, Oklahoma, Colorado, Wyoming, Utah, Nevada and California was made in four months and twelve days.

This piece of motor equipment traveled all kinds of roads over a wide range of altitude from sea level to over 8,000 feet, under all sorts of weather conditions and with temperatures ranging from 15 degrees above zero to 110 degrees, and over flat country and up grades as steep as 15 per cent.

All along this nation-wide route the V-12 was demonstrated in 74 cities and pumped for a total of 120 hours, the equivalent of about 4,000 miles of travel, or in all a total of 20,000 miles. When the machine visited Denver, Colo., it delivered 1,300 gallons per minute at 120 pounds pressure, said to be the greatest amount of water ever pumped at this altitude.

Throughout the pumper's entire trip ordinary gasoline was used. A remarkable feature of the trip, which took the apparatus through sand up to the hub, was that it climbed mountains without ever once shifting the gears out of the high-speed position.

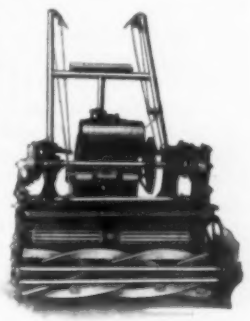
Reducing and Regulating Valves

The possibility of securing a variety of automatic operations in a water pressure reducing and regulating valve is found in the Ross unit made by the Ross Valve Manufacturing Co., Inc., Troy, N. Y. The present Model 40 WR is a combined reducing and check valve which will not permit reversal of flow when the high pressure falls below the pressure on the low-pressure side. It is also a combined reducing and reverse flow valve, as the design permits the reversal of flow if desired. The valve may be also used as a combined reducing and altitude valve to control the elevation of water in a standpipe or elevated tank, and the discharge from the tank to the distribution system at a predetermined constant pressure. It may further be used as a two-way reducing valve controlling the flow in either direction through the valve for a predetermined pressure. Electric or hydraulic remote control appliances may be attached to the reducing valve or any of its combinations. External pilot or pilots control the main valve and are easily accessible for testing or changing the adjustments. The automatic operations are performed without shock or water hammer, and in the reducing valve pressure on the discharge side is constant and not affected by any variations in rate of flow or upstream pressures.

THE ROSS AUTOMATIC REGULATING VALVE

A Power-driven Lawn Mower and Trimmer

A 25-inch power lawn mower and trimmer with no side wheels or front casters, the driving rollers of which do not extend beyond the ends of the cutters, hence with no tendency to roll down uncut grass and leave ridges, is manufactured by The Locke Steel Chain Co., Lawn Mower Division, Bridgeport, Conn. This Locke power lawn mower has cutter units which rest lightly on the lawn, so that the mowers can be used safely on soft turf or on newly seeded ground. There is a cleaning roller which prevents accumulation and the dropping of clumps of cut grass; thus the mower can be used when there is dew on the grass or in very wet weather. The revolving cutters, which are power driven, are furnished with five crucible steel blades scientifically formed and mounted and able to cut high grass. The stationary knife has four cutting edges.



A 25-INCH POWER LAWN MOWER

When using the machine as a lawn trimmer, the operator can cut the grass as close as 1½ inches to a tree, fence, wall or other object. The cutter can also be projected over the edge of the lawn, whether natural or curbed, without damaging either the edge or the mower. The machine has sufficient power to mow up grades as steep as 50 per cent. The revolving cutter is provided with a spring attachment so that the knives can be set by a single screw at each end. These springs permit the knives to separate when sticks or the like are encountered, and thus prevent damage. The drive chains are of the roller type and are protected in such a manner that cut grass cannot be carried to the sprockets. The motors are made by Briggs and Stratton, and the remainder of the mower fabricated in the manufacturer's own works. The motors are air-cooled, hence they require no pumps or radiators, and a self-contained magneto overcomes battery trouble. A throttle control regulates the speed, which can be from a slow walk to over 3 miles per hour. The mower will cut ¾-acre per hour, consuming about one pint of gasoline.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Street Lighting—More or Less?

By G. H. STICKNEY
Consulting Engineer, Nela Park, Cleveland, Ohio

MANY municipalities are being forced to analyze all expenditures with unusual care, in order to balance budgets on reduced tax collections. Such analysis is highly proper and likely to make for increased efficiency of the administration of public funds. It must, however, be conducted with discrimination, lest in some instance serious losses be incurred by the public which more than offset the savings. Along with other items of expense, street lighting is being scrutinized.

For over thirty years, the writer has had the opportunity of watching the growth of street lighting. In that time the number of miles of lighted streets has increased tremendously. There have also been notable advances in the amount of light per mile of street. And yet, taking into account the needs introduced by new conditions, street lighting has lagged considerably behind other lighting practices. Several conditions have contributed to retard street lighting. One of these was the relatively high investment cost of making improvements, as compared to the operating cost. Moreover, street lighting is "everybody's business" and no one interest was encouraged by a large economic gain to promote better lighting.

On the other hand, there have been almost no recessions, because practically every extension or improvement of lighting has obviously justified itself. Even in times of depression, it has always been considered unsound to save expenditure by cutting down on street lighting.

Now for the first time within the writer's recollection, a considerable number of municipalities are studying street lighting seriously with the view to making a reduction in expense. Such studies are of course justifiable, but should be carefully considered before action is taken, lest serious loss of life, limb and property be inflicted upon those whom the savings are intended to benefit. Although some economies might be made in this connection, there is, in the writer's opinion, no opportunity to make any real saving without a sacrifice in effectiveness, from which serious consequences would be almost certain to result.

Let us consider some of the changes which have come about in the last three decades. In 1900 there were practically no automobiles upon the streets. The horse-drawn traffic moved at a speed of four to eight miles an hour. Traffic subsided very considerably at sundown. In some of the large cities there were section which peaceful citizens avoided for fear of assault and which even the police patrolled in squads, rather than singly. Women even hesitated to venture unattended onto the streets of the better sections.

We have not reached the millennium, but no one can deny that street lighting has, in a relatively short period of years contributed largely to reducing the danger of being molested, and has given to our citizens a new freedom of action.

Adequate Lighting for Traffic

As to traffic—the automobile has increased the speed of travel many-fold, and with it the stopping distance. It is not conceivable that we shall return to the old speed limitations. The amount of travel, especially night travel, has increased even more rapidly than the speed. To be sure, each automobile carries its own lighting, but even with the remarkable advances in headlighting, such lights alone are not effective on crowded streets. The dense high-speed traffic is piling up an appalling number of deaths and personal injuries as well as financial losses.

From an extensive survey of the statistics of traffic accidents, the National Safety Council has estimated that one-third of those occurring after nightfall are due to the inadequacy of the illumination.

Cleveland—the birthplace of the Brush arc lamp—has always been considered to have relatively good street lighting. During the past decade the so-called "white way" type of lighting has been extensively installed on leading thoroughfares. Analysis of the traffic accident record made in connection with this improvement leads to the conclusion that a 35 per cent reduction in traffic accidents has been effected. This experience is briefly related in THE AMERICAN CITY, January, 1931, more in detail in the *Electrical World*, June 20, 1931, and abstracted in the *Literary Digest*, August 1, 1931.

Estimates indicate that the country's financial loss from traffic accidents in city streets is nearly as large as its entire expenditure for street lighting—about 65 million dollars annually.

Who can put a true value on human life or the damage resulting from serious physical deformity? Every one, rich or poor, old or young, is a potential victim. The readers of this, and those whom they hold most dear, are not free from the danger. Within a week of this writing, a friend of the writer was killed in an accident which proper street lighting would almost certainly have prevented. No one needs such protection more than the pedestrian, since he is less easily seen and has not a steel framework to ward off any of the blow.

In the absence of street-lighting reductions in the past, there are few, if any, statistics as to the ensuing increases in traffic accidents. During the Great War, however, when the threat of air raids compelled darkening of the streets of London, the hardships endured were sufficient to attract attention in this country even during that period of stress. Estimates based upon the record of the Metropolitan Police District indicates a resultant increase of 15 per cent in fatal accidents, and about 30 per cent in non-fatal accidents.

In connection with the International Illumination Congress and Commission

meetings, the writer visited Great Britain in the fall of 1931, observed street-lighting conditions and discussed that subject with leading experts. It was apparent that even in that time of severe depression, the British were installing new and improved street lighting and increasing their street-lighting expenditures considerably. Evidently the recent lesson was still vividly before the British public.

Clearly, what is needed for safe travel is more, not less, street lighting and any saving must be large to justify serious consideration of any reduction in the amount of street lighting.

Light and Crime

The preference of criminals for darkness as a cover for their nefarious activities is so marked that when a wrongdoer is bold enough to operate in broad daylight, that fact is heralded in the newspaper headlines. The professional criminal plans his getaway more carefully than anything else. Getting caught is more serious to him than missing his prey. Therefore, the necessity of traversing a cordon of well-lighted streets is a strong crime deterrent.

Notable decreases in crime in the business center of Cleveland followed the installation of white way lighting. On the other hand, the city of Chicago, responding to the demand to save coal during the late war, made a short experiment in street-lighting reduction. The criminal response was so immediate that the experiment was promptly discontinued. So far as is known to the writer, no statistics on this subject are available, beyond a collection of newspaper headings. It would seem that any large reduction in street lighting would be regarded by outlaws as an invitation to them to visit that city. This consideration must therefore be put on the scale when any such saving is being weighed.

Safety from street accidents and crime has always been the fundamental reason for street lighting and apparently will continue so. In recent years a relatively few miles of business streets have been illuminated to higher levels as a means of advertising the city or district and so promoting its growth. While such lighting has been found to have a value in enhancing safety, the humanitarian elements have been secondary to the business aspect. If any reduction were to be made, it would seem logical to start in on such districts. But even here, on the basis of financial return and especially after the investment has been made, there may be serious doubt of the advantage of retrenchment. Most cities and towns are in competition with other cities and towns. Will diminution in such lighting reduce business or transfer it to other places? Will it mark a city as losing progressiveness? Each must figure the question out for itself, and weigh it against the possible savings.

Deceptive Savings

So far we have considered the disadvantages of street-lighting reduction. The only advantage of such reduction would be a saving in expenditure. If that saving were large, some sacrifice might be justifiable in order to secure it. It is therefore pertinent to make some inquiry into possible reductions in the cost of an operating system.

There are two principal ways in which a saving might be effected. The number of street lamps might be reduced, or the light output of lamps might be diminished. Also, there are several ways in which the saving might be estimated. If the local lighting company has been too trustful in contracting, it may be possible for the city to make a saving for which the company does not make a corresponding operating saving. In such a case the company must try to find a way to make up the loss by increasing its charge on the local inhabitants for other service. The only fair saving is that based upon a reduction in the actual cost of the service.

To illustrate, let us assume that 6 per cent of the lamps are to be discontinued. There will be a saving of energy, lamp renewals and maintenance. The investment in equipment, wiring and power station will not be reduced. Because this investment is so large a part of the cost of street-lighting service, most lighting companies are unwilling to add street lamps without an assurance that they will be maintained for enough years to write-off a fair part of this installation cost. Perhaps one-third of the cost of a lamp can be saved by discontinuing it. The amount would differ in different cases, but it is not likely to exceed this proportion. Then instead of an apparent 6 per cent saving, only 2 per cent would actually be secured.

Another method of saving might be to substitute smaller incandescent lamps in the existing system. For example, if 6,000-lumen lamps were to replace 10,000-lumen lamps, the light would be reduced by 40 per cent, and the only savings would be nearly 40 per cent in electricity consumption and a little less than 20 per cent in lamp cost. Since the cost of electricity and lamps forms about 35 per cent of the cost of street lighting, the actual reduction in cost would be approximately 15 per cent. In other words, a reduction of 40 per cent in the available light would result in only about 15 per cent saving in lighting cost, and where the distribution of electricity is underground, the percentage saved would be even less.

The writer knows of no method of reducing street-lighting costs by general curtailment which does not make at least two or three times as large a relative reduction in the amount of light. Taking into consideration the fact that practically every municipality really needs more rather than less street lighting, the opportunities for reasonable curtailment of the expense of street lighting do not appear very promising. A saner program for the municipality which is financially embarrassed would be to survey its street lighting to make sure that it is effectively arranged, and whether any slight changes can be made which will enhance safety. Such a plan might permit a postponement of street-lighting additions which are really needed at the present time. Any city that can afford to make street-lighting improvements at the present time will find it economically advantageous to do so, especially since the construction will add to local employment.

A Brightly Lighted Underpass

STATE STREET UNDERPASS, SCHENECTADY, N. Y.
This is illuminated by 500-watt pendent Novalux units. See page 143

Bridge Illumination

By R. M. SWETLAND

Illuminating Engineering Laboratory, General Electric Company, Schenectady, N. Y.

THE rapid increase in vehicular traffic density upon our main thoroughfares, together with the greater after-dark traffic flow—due, in an increasing degree, to the added impetus continually being given to adequate highway lighting—renders the problem of suitable bridge illumination one of special significance.

Other factors being equal vehicular and pedestrian traffic approaching and crossing a bridge is subject to the additional hazard of definite limitations of roadway and sidewalk area. Such bridge

FIG. 1—WESTERN GATEWAY BRIDGE, SCHENECTADY, N. Y.

sections often constitute a "bottle neck" impedance to the flow of traffic during the period of darkness. Accidents occurring on bridges usually are attended with greater personal risk to the motorist and pedestrian, and result in more serious traffic stoppages, than similar traffic irregularities upon unrestricted road sections.

Safety Through Adequate Lighting

Experience has proved that adequate and efficiently applied street lighting is the most effective method of safeguarding bridge traffic and, at the same time, of enhancing the architectural appearance of the structure itself.

In addition to this desirable safety factor, the installation of proper street lighting on a bridge definitely increases the return on the fixed investment by increasing the bridge capacity during after-dark peak load periods. In other words, efficient illumination is equivalent to adding several feet to the width of the bridge roadway at a fraction of the cost.

It is with these thoughts in mind that the following suggestions relative to bridge lighting are being submitted. It is hoped that these ideas may be of particular interest and help to bridge architects and engineers in bringing to them more definite information concerning the various types of lighting equipment available for bridge lighting, together with a better understanding of the accepted methods of applying this equipment.

The following recommendations are classified as applying to, (a) heavily-traveled main traffic arteries, and (b) to thoroughfares of somewhat secondary importance carrying a medium density of traffic. From the standpoint of illumination, these recommendations conform to the opinions of the Street Lighting Committee of the Illuminating Engineering Society and to good modern street-lighting practice.

Average street-lighting intensity is ordinarily evaluated on a basis of total generated lumens per linear foot of objective street. Series Mazda lamps, having a lumen rating of ten times their candlepower value, are referred to in these recommendations, since they are used in approximately 90 per cent of existing incandescent-lamp street-lighting installations. It follows, therefore, that a 10,000-lumen (1,000-candlepower) series lamp to each 100 feet of street results in an average of 100 lumens per linear foot of street.

FIG. 2—STOTTVILLE-STUYVESANT FALLS BRIDGE, COLUMBIA COUNTY, N. Y.

CONDENSED RECOMMENDATIONS FOR BRIDGE LIGHTING

Density of Traffic Flow	Lamp Sizes	Mounting Heights	Spacing and Arrangements of Luminaires	Lumens per Linear ft. of Street	Remarks
Heavy Traffic	10,000/15,000 lumen series or 500-750 w. multiple	18-22 feet	90-125 feet apart and opposite	160-330	Refractors or other light controlling equipment advisable
Medium Traffic	6,000/10,000 lumen series or 300-500 w. multiple	18-22 feet	similar spacing	100-220	Refractors or other light controlling equipment advisable

A suitable refractor, used in connection with a light-density diffusing globe, serves the useful purpose of intercepting the upward—and, in this case, wasted—light, redirecting it below the horizontal plane of the luminaire in an efficient distribution over the objective roadway area. The resulting uniformity factor, i.e., the ratio of minimum to maximum intensity along the roadway, is thereby increased, with an accompanying improvement in general visibility; assuming, of course, that objectionable glare has not been introduced.

Circuits

Referring to the methods in common use for supplying energy to such bridge lights, both the series and multiple distribution systems should be mentioned. The series system of distribution is divided into the following four classifications:

(a) The straight series, low-current (usually 6.6-ampere) circuit which connects all lamps in series directly with the secondary coil of a constant-current regulating transformer.

(b) A circuit similar to the above, except with each lamp connected to the main series circuit through an individual series transformer. This transformer serves the dual purpose of increasing the 6.6-ampere current to the 20 amperes required by the lamps, and of insulating the standard and lamp socket from the higher voltage of the main 6.6-ampere circuit. Where ornamental

FIG. 3—STATE STREET BRIDGE, ROCHESTER, N. Y.

standards are used, these transformers may be installed in the base of each standard.

(c) The group system, in which groups of lamps are connected in series to the secondary winding of a small 3- or 5-kw. series transformer which has its primary connected in series with the secondary coil of the main constant-current regulating transformer.

(d) The use of a 20-ampere secondary coil on the constant-current regulating transformer permits the use of 20-ampere lamps in the circuit without the necessity of an individual transformer at each lamp, and also reduces the series line voltage to approximately one-third that of a similar capacity 6.6-ampere circuit.

Local practice will usually determine the particular type of multiple circuit to be employed. Line losses are ordinarily reduced to a minimum, however, by adhering to the 115-230-volt, 3-wire, grounded-neutral system.

Cable

No. 8 A.W.G. single-conductor, steel-armored parkway cable is advised for these 6.6-ampere series lighting circuits. The cable should be insulated for the open-circuit voltage of the constant-current regulating transformer. In the event of the use of the smaller group series transformers, this parkway cable need only be insulated for the open-circuit voltage of the group transformer. In order to reduce the I^2R and inductive losses, No. 6 A.W.G. non-metallic parkway cable is advised for all straight 20-ampere series lighting circuits.

Since the fundamental purpose of a bridge is to carry traffic, it logically follows that the primary objective of a bridge-lighting system is to safeguard this traffic by efficient and effective illumination. However, the value of the architectural appearance and the harmonious design of such bridge-lighting equipment is an item of important secondary consideration and should be given careful thought by the bridge designer as well as by the illuminating engineer. The accompanying illustrations show a variety of standard designs of luminaires, brackets and ornamental lighting standards, together with examples of special design equipment suitable for bridge installation.

Typical Installations

Figure 1 illustrates the built-in type of concrete lamp standard which is incorporated in the construction of the bridge railing. The luminaire is usually attached to this support by means of an ornamental bracket of cast iron or bronze.

Figure 2 shows the use of a metal standard (fluted steel or cast iron) mounted upon the bridge balustrade or railing; Figure 3 illustrates similar standards located along the sidewalk curb line in cases where the railing construction is not suitable for supporting these standards and where the sidewalk width permits this curb location. Such lighting standards may be of heavy-duty construction for trolley span-wire support.

The lighting of a steel span bridge section is usually best accomplished by means of pendent or upright type luminaires attached to upright members of the truss by means of suitable brackets.

FIG. 4—GANDY BRIDGE, TAMPA BAY, FLORIDA

A section of Gandy Bridge, which spans Tampa Bay, Fla., is shown in Figure 4. Highway lighting units mounted on tubular steel poles 35 feet above the roadway and spaced approximately 250 feet apart are utilized for lighting this bridge causeway. Refractor type highway lighting units for similar installations may be mounted at a 23-25-foot height above the road surface.

Special Features

There are a number of elements in modern street-lighting luminaire design which lend themselves especially well to bridge-lighting installations. One of these is a new telescoping refractor holder which facilitates servicing this unit and insures a dampening effect on vibrations being transmitted to the refractor. There also is a spring-hanger device which prevents bridge vibrations from affecting the lamp filament in the pendent-type luminaire. This hanger is particularly suitable for use with lighting units suspended under railroad bridges and viaducts.

Light shields are effective in eliminating glare and specular reflection to pilots on boats passing under lighted bridge sections. Internal refractors and partially enameled outer diffusing globes may also serve a similar purpose.

Street underpasses under railroad bridges and viaducts require a relatively high degree of well-diffused illumination. On page 141 is shown such an underpass installation with a spring hanger inserted between the pendent type luminaire and the bridge girder for protection against vibration. In this instance 500-watt, general-service Mazda C lamps are used in the pendent street-lighting unit.

Floodlighting

Many bridge structures, because of their size and type of architecture, present an imposing and gracefully beautiful appearance during the daylight period. These striking sights are lost to night travelers unless suitable illumination by floodlighting is provided. An interesting example of this type of bridge illumination is the Colorado Street Bridge in Pasadena, Calif. Groups of floodlights were located on the river bank at each end of the bridge and sufficiently below the bridge-deck level to eliminate all possibility of glare to vehicular traffic on the bridge.

Whatever the nature of the bridge involved, the problem of adequate ornamental street lighting is deserving of the most thoughtful consideration. Illuminating engineers are always available for assistance in the solution of these problems.

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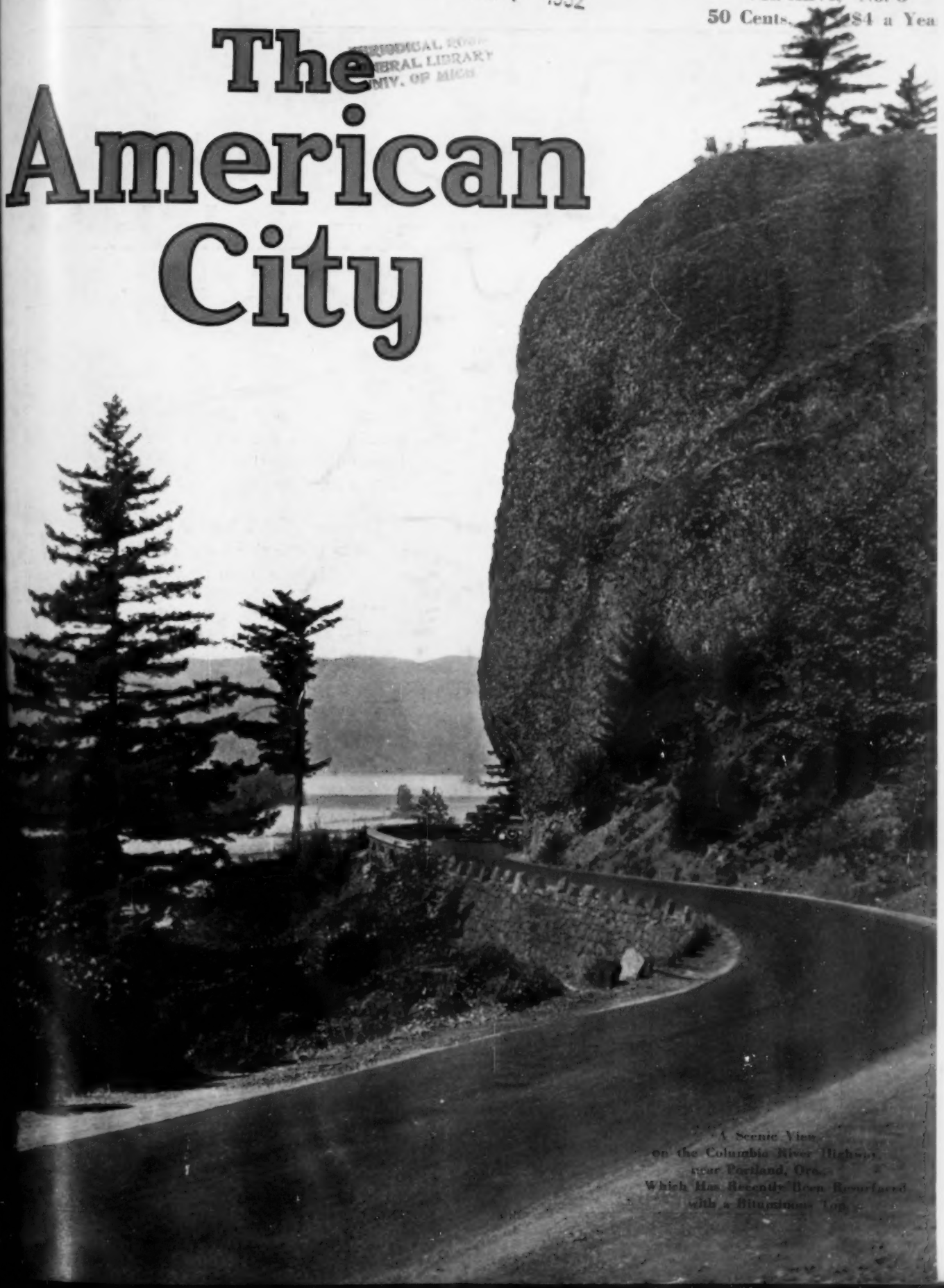

A Scenic View on the Columbia River Highway near Portland, Ore., Which Has Recently Been Resurfaced with a Bituminous Top